VOLUME 13 • NUMBER 5 • *May 1958*

Geriatrics

DEVOTED TO DISEASES AND PROCESSES OF AGING

A Symposium on Geriatrics from The Hahnemann Medical College

JOHN S. MOYER, M.D., *Guest Editor*

In this timely presentation, internists from the faculty of the Hahnemann Medical College discuss the special problems which are involved in the treatment of the geriatric patient as they are encountered in the various specialties of medicine.

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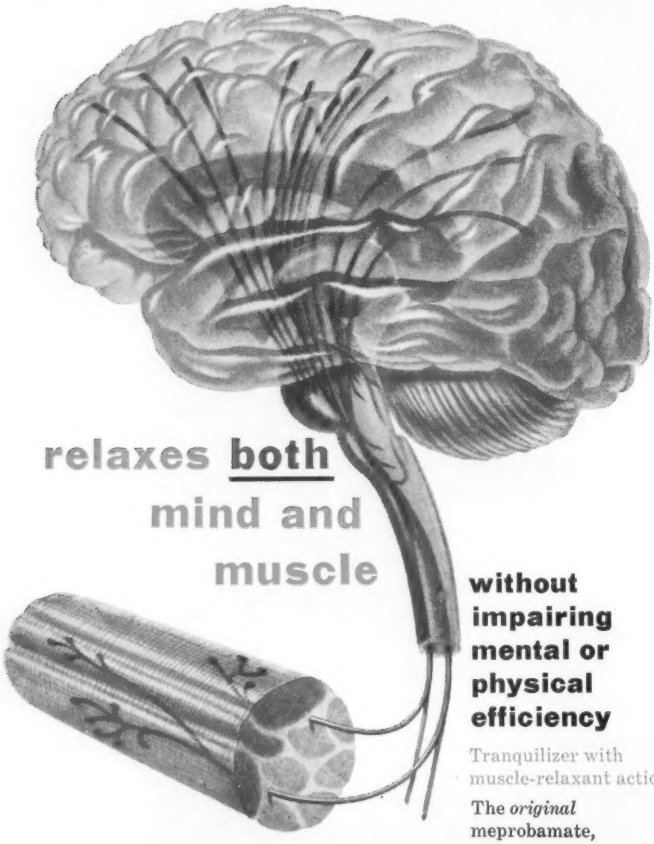

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Geriatrics

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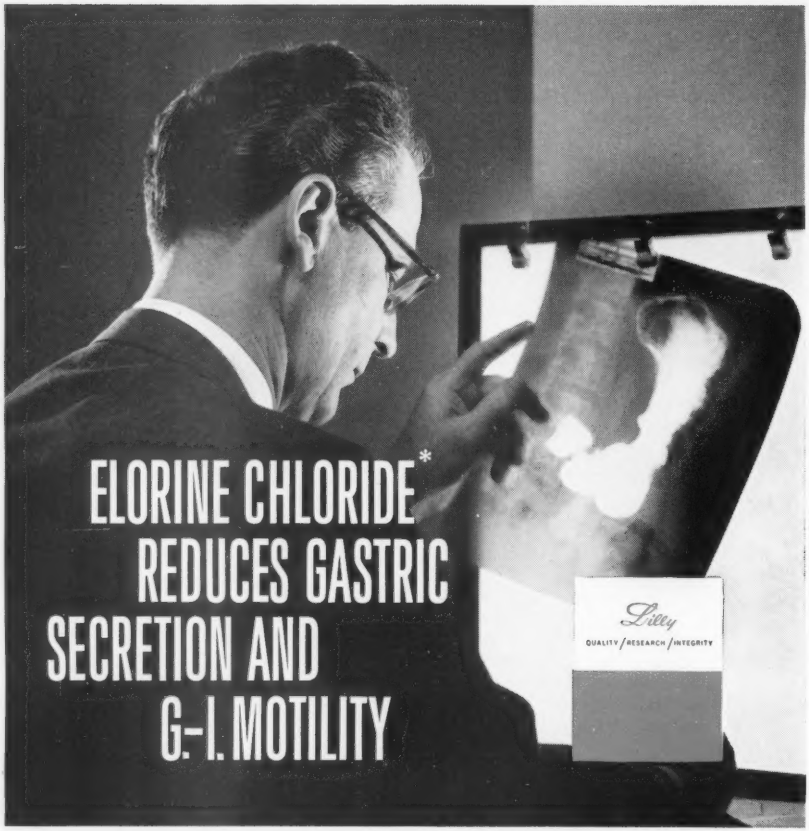

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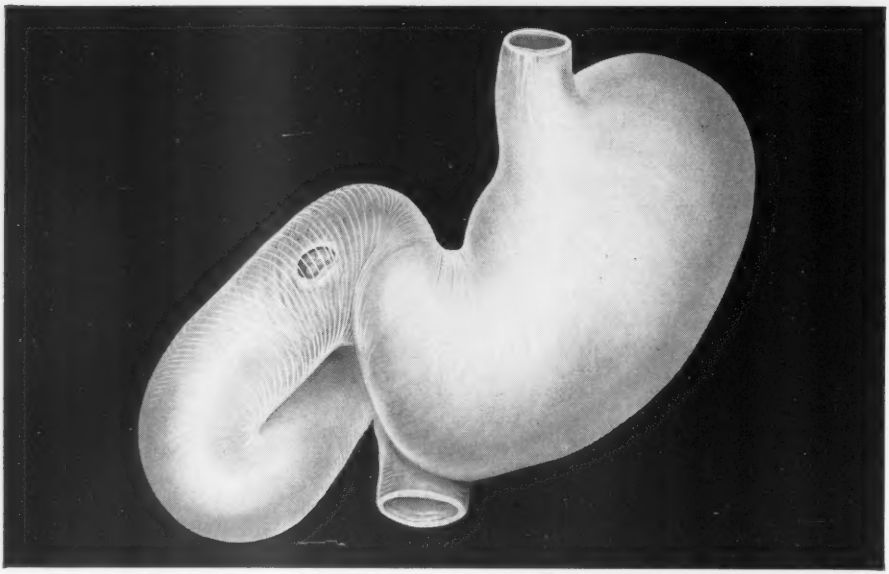

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*Lichstein, J.; Morehouse, M. G., and Osmon, K. L.: Pro-Banthīne in the Treatment of Peptic Ulcer. A Clinical Evaluation with Gastric Secretory, Motility and Gastroscopic Studies. Report of 60 Cases, Am. J. M. Sc. *232*:156 (Aug.) 1956.

SEARLE

TO THE JUNE ISSUE

• Because of space limitations, three excellent papers prepared for the Hahnemann Symposium on Geriatrics were necessarily postponed until the next issue of the journal. These papers, which will appear together in June as a continuation of the Symposium, include the following titles and authors: *Antihypertensive Therapy for the Elderly Patient,* by John R. Beem and John H. Moyer; *Aging and the Cutaneous System,* by Carroll F. Burgoon, Jr., and Jane S. Burgoon; and *Common Digestive Problems in Older Patients* by Charles M. Thompson and Joseph M. Gambescia.

• Experiences with *Hepatitis in the Geriatric Patient* are reported by H. D. Bennett, chief of the medical service of the Veterans Administration Hospital of Houston and associate professor of medicine at Baylor University College of Medicine. Clinical material for the study consisted of patients over 60 with acute hepatitis in two large VA hospitals over a ten-year period. Most of the admissions were for serum hepatitis in those over 60, as contrasted with infectious hepatitis in those under 60. Serum hepatitis was the more serious form in both age groups, but it was found to be particularly virulent in those over 60, with a mortality of 25 per cent. Dr. Bennett discusses the therapeutic approaches pertinent to older patients, and outlines the various regimens to be used.

• In order to determine if there are *Electrocardiographic Changes with Advancing Age,* cardiologists Leo M. Taran and Nelly Szilagyi, Brooklyn Hebrew Home and Hospital for the Aged, Brooklyn, New York, studied electrocardiograms of 602 men and women in the sixth through the ninth decades. The predominant findings were those significant of left ventricular hypertrophy and ischemia in the presence or absence of clearcut hemodynamic causes of increased work of the left heart. The incidence of electrocardiographic evidence of acute or healed myocardial infarction was surprisingly low.

• Richard Torpin, professor and chairman of the Department of Obstetrics and Gynecology, Medical College of Georgia, discusses the relationship of *Uterine Prolapse, Enterocele, and the Upper Pelvic Diaphragm* in elderly women. The cul-de-sac of Douglas lies upon the upper pelvic floor, a sheet of supporting tissue which holds up the bladder, uterus, and upper rectum. This sheet may be congenitally impaired or relaxed by intra-abdominal pressure of the upright body position. Dr. Torpin describes an operation for genital prolapse which is simple to perform and which has been effective in the treatment of more than 200 patients.

• The character of nutrition throughout life is the principal environmental factor determining longevity, writes Joseph I. Goodman, chief of the diabetes clinic of Mt. Sinai Hospital of Cleveland, in his discussion of *Nutrition, Life Tenure, and the Medicine of Degenerative Disease.* Nutrition and health are inseparable, yet it has not been adequately recognized that well-fed individuals are less subject to almost every type of pathology than malnourished ones. Obesity appears to be significant in the increasing incidence of diabetes, gangrene, congestive heart failure, and cerebrovascular accidents, thus playing a large part in the disabilities of later life.

• *Insomnia in the Aged* is a common complaint, writes Zachary Sagal, internist and formerly assistant clinical professor of medicine at New York University, now living in Sherman Oaks, California. Although at times the complaint seems unjustified and factually incorrect, it is best to allow the old person the extra amount of sleep desired. According to Dr. Sagal, some clinicians believe that old, debilitated individuals need and get a good deal of sleep. Recent researches seem to indicate that sleep has a restorative function beyond that of a general nature.

• • •

For these and other articles, abstracts, and reviews, read every issue of Geriatrics.

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Geriatrics

THERAPEUTIC GUIDE

May 1958

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*Alexander, L.: Chemotherapy of depression —Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958.

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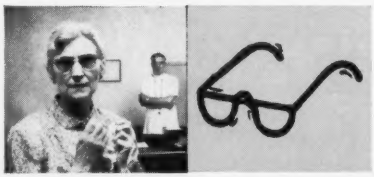

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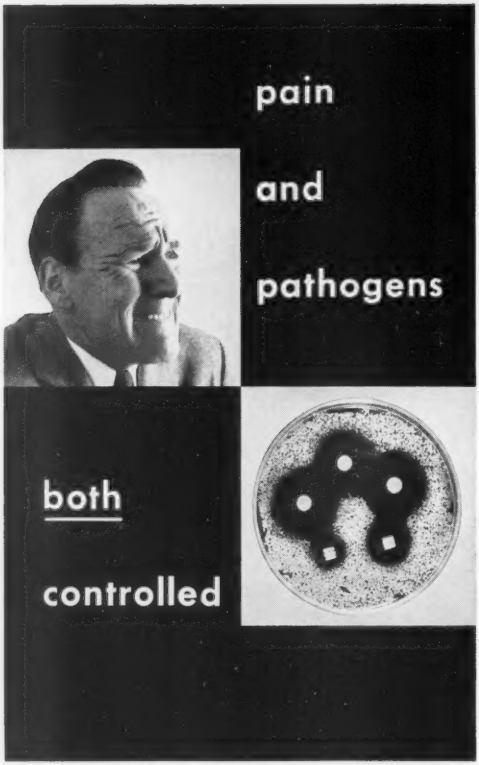

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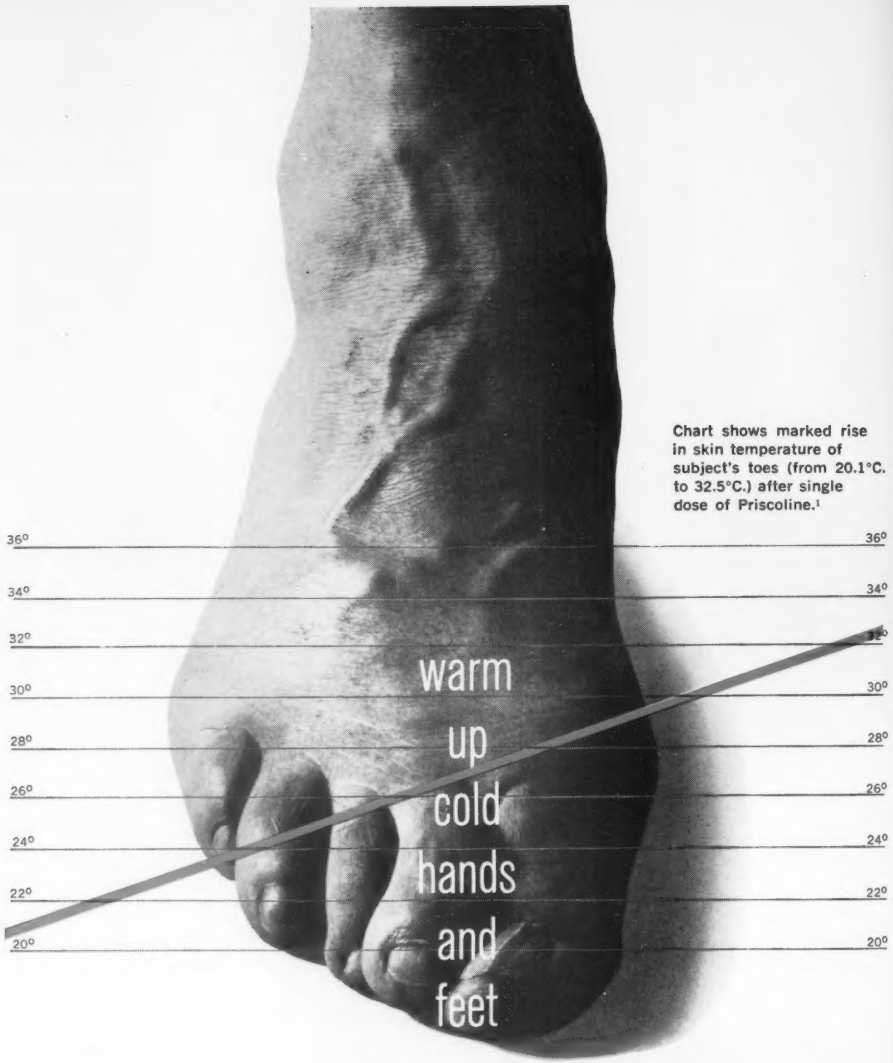

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1. Reedy, W. J.: J. Lab. & Clin. Med. 37:365 (March) 1951.

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and inflammation here...
it could be mild or
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primary or secondary fibrositis
or even early
rheumatoid arthritis

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Ascorbic acid	20 mg.

Packaging: Sigmagen® Tablets, bottles of 100 and 1000.

References: 1. Spies, T. D., et al.: J.A.M.A. 159:645, 1955. 2. Spies, T. D., et al.: Postgrad. Med. 17:1, 1955. 3. Gelli, G., and Della Santa, L.: Minerva Pediat. 7:1456, 1955. 4. Guerra, F.: Fed. Proc. 12:326, 1953. 5. Busse, E. A.: Clin. Med. 2:1105, 1955. 6. Sticker, R. B.: Panel Discussion, Ohio State M. J. 52:1037, 1956.

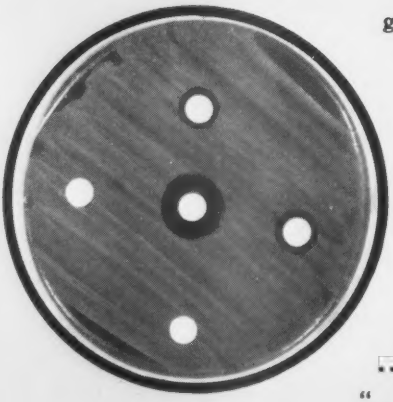
Complete information on the use of Sigmagen available on request.

Schering

SCHERING CORPORATION • BLOOMFIELD, N. J.

S-G-J-198

on the problem of an



A POINT OF VIEW IN '55

"At this time, it appears that the problem of antibiotic-resistant bacteria is the greatest fear in the future with chronic infections of the . . . urinary tract . . ."[1]

A POINT OF FACT IN '58

". . . This prediction has proved to be correct for both gram-positive and gram-negative organisms."[2]

. . . WITH ONE NOTABLE EXCEPTION

". . . studies indicate that microorganisms, in vitro and in vivo, do not appear to develop resistance to FURADANTIN."[3]

f antibiotic-resistant bacteria

for acute and chronic genitourinary tract infections

FURADANTIN®

brand of nitrofurantoin

AVERAGE FURADANTIN DOSAGE: In acute, complicated or refractory cases and in chronic infections—100 mg. q.i.d., with meals and with food or milk on retiring.

REFERENCES: 1. Flippin, H. F.: Virginia M. Month. 82:435, 1955. 2. Caswell, H. T., et al.: Surg. Gyn. Obst. 106:1, 1958. 3. Nesbitt, R. E. L., Jr., and Young, J. E.: Obst. Gyn., N. Y. 10:89. 1957.

NOW, for hospitalized patients, for severe urinary tract infections when peroral administration of FURADANTIN is not feasible and for serious infections as septicemia (bacteremia): **FURADANTIN** *Intravenous Solution*

NITROFURANS . . . a *new* class of antimicrobials . . . neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

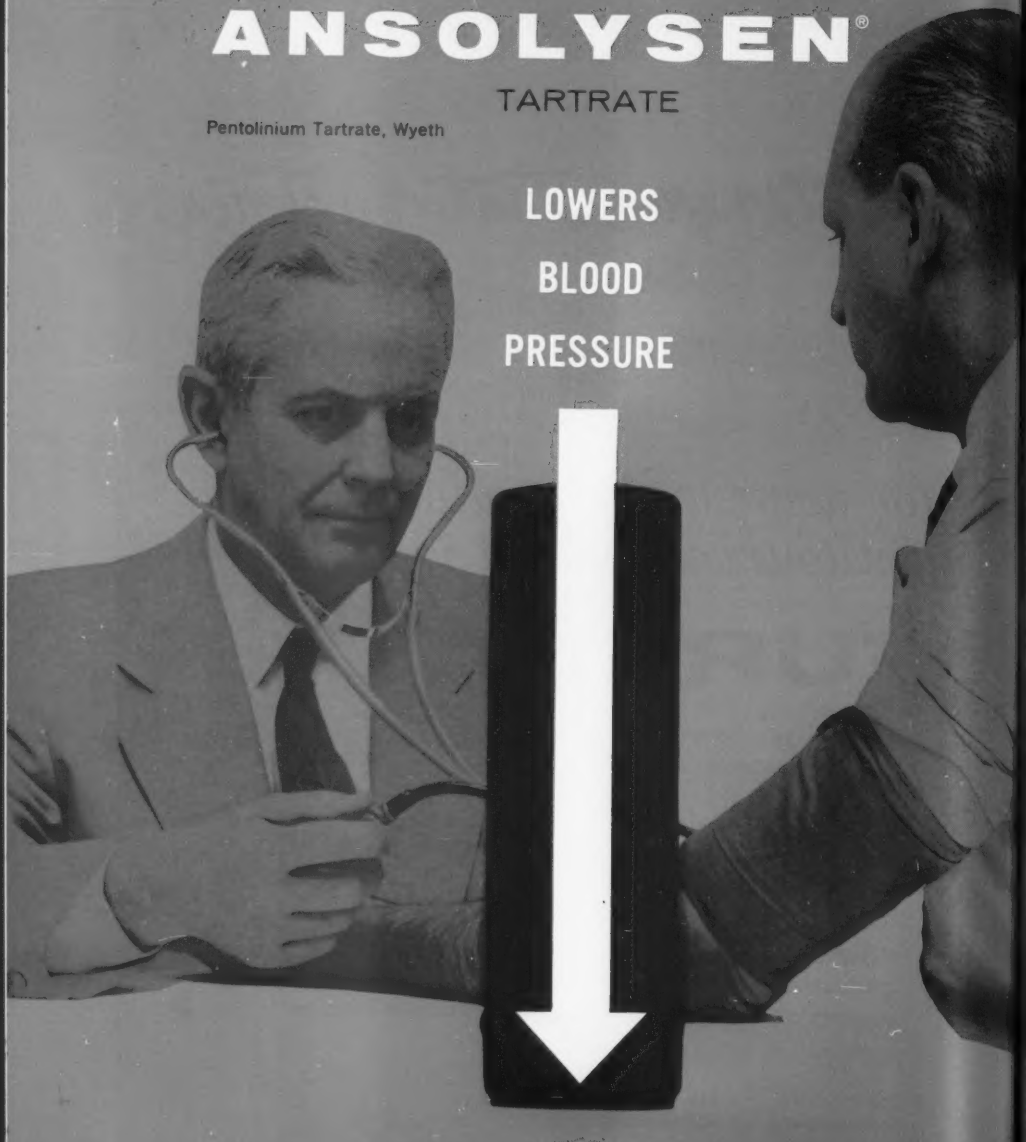
in hypertension

ANSOLYSEN®

TARTRATE

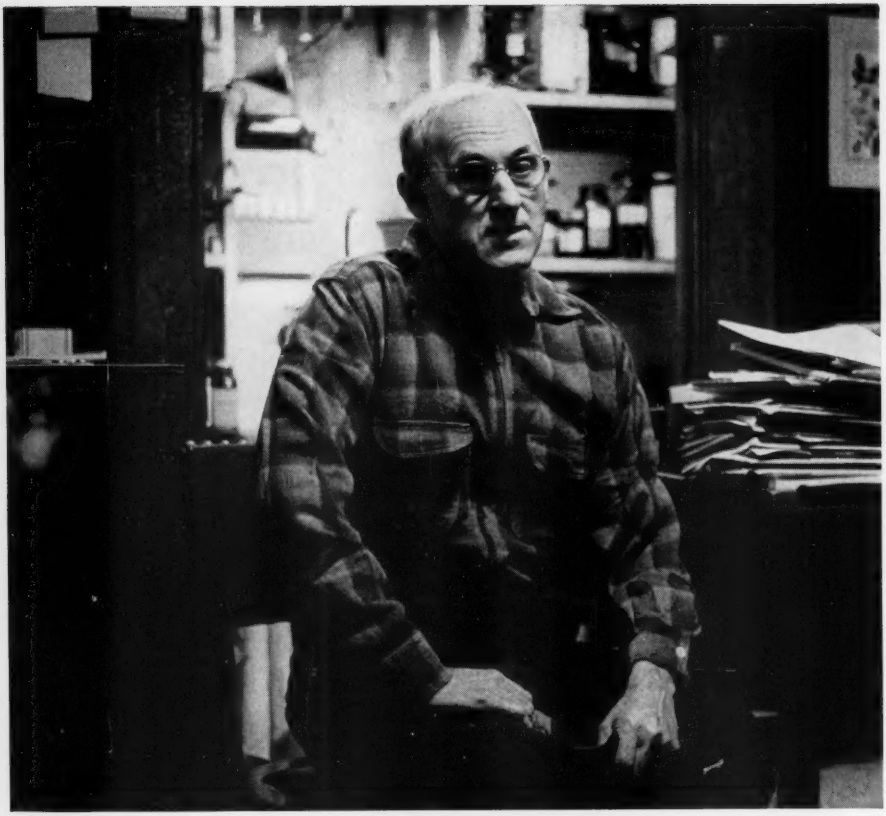
Pentolinium Tartrate, Wyeth

LOWERS
BLOOD
PRESSURE



Wyeth

Philadelphia 1, Pa



"I don't know what's wrong, Doctor, I'm just off my feed."

You see these "down-in-the-dumps" patients only too often.

The sallow businessman. The listless housewife. The elderly patient who eats next to nothing—and looks it. The lazy, underweight adolescent. Convalescents of all ages.

When you wish to increase appetite, to restore vim, vigor and vitality in the patient who keeps saying, "I just don't feel quite right," prescribe 'Trophite'—the high potency combination of B_{12} and B_1. Each *delicious* teaspoonful, or each convenient tablet, supplies 25 mcg. B_{12} and 10 mg. B_1.

TROPHITE* for appetite

*T.M. Reg. U.S. Pat. Off.

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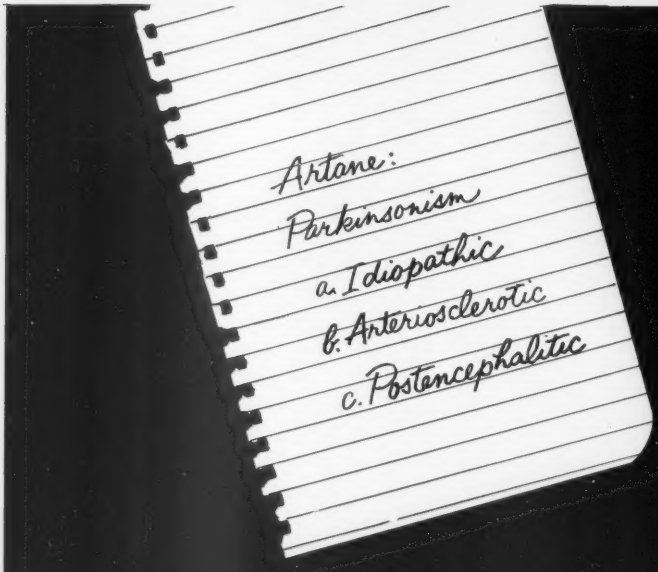

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HYDROCHLORIDE TRIHEXYPHENIDYL HCl LEDERLE

ARTANE is effective in all forms of Parkinsonism, cardiac, hypertensive, postencephalitic and idiopathic types. Well tolerated, ARTANE maintains strong antispasmodic action over prolonged periods of treatment. ARTANE is remarkably free of serious toxic properties, has no deleterious effect on bone marrow function.

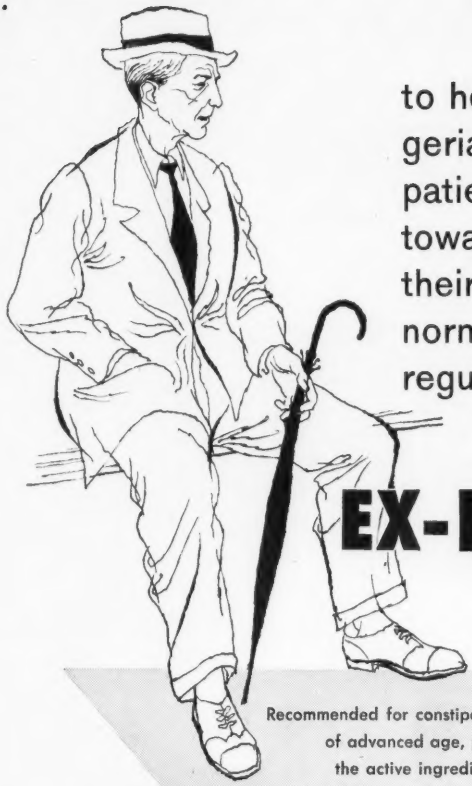
Supplied: 2 mg. and 5 mg. tablets, and elixir containing 2 mg. per teaspoonful (5 cc.)

Dosage: 1 mg. the first day, gradually increased, according to response, to 6 mg. to 10 mg. daily divided in 3 doses at mealtime.

*Reg. U.S. Pat. Off.

Lederle

LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY
PEARL RIVER, NEW YORK



to help geriatric patients toward their normal regularity

EX-LAX

Recommended for constipated patients of advanced age, phenolphthalein, the active ingredient of Ex-Lax, acts gently, overnight . . . "in the morning produces a stool very much like normal"[1]. . . continues to act as a "mild aperient for several days,"[2] lessening need for frequent medication. No "adverse effects, such as tissue irritation, toxic symptoms or interference with the normal physiological functions"[3] were observed by isotope research.

PALATABLE

EFFECTIVE

WELL-TOLERATED

1. H. Beckman: Treatment in General Practice, W. B. Saunders Co., 1946; p. 478. 2. A. Grollman: Pharmacology and Therapeutics Lea & Febiger, 1954; p. 391. 3. W. J. Visek, W. C. Liu, L. J. Roth: Studies on the Fate of Carbon-14 Labeled Phenolphthalein. Jour. Pharmacol. and Exp. Therapeutics, July 1956; 117:347.

whenever digitalis is needed

'LANOXIN'® brand DIGOXIN

formerly known as Digoxin 'B. W. & Co.'®

"If one digitalis agent were to be recommended for its adaptability to the many and varied clinical contingencies, we believe Digoxin would be the drug of choice."

Lown, B., and Levine, S. A.: Current Concepts in Digitalis Therapy, Boston, Little, Brown & Company, 1954, p. 23, par. 2.

'LANOXIN' TABLETS	'LANOXIN' INJECTION	'LANOXIN' ELIXIR PEDIATRIC
0.25 mg. scored (white) 0.5 mg. scored (green)	0.5 mg. in 2 cc. (I.M. or I.V.)	0.05 mg. in 1 cc.

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For ultimate convenience on house calls, or in the office—at the physician's fingertips, the right size catheter, sterile, ready for instant use. Packs and stays neatly in bag, with packaging that ensures, under normal handling, sterility maintained up to two full years. Simple, convenient and easy to open. Available through leading Surgical Supply Dealers.

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581

AN AMES CLINIQUICK

CLINICAL BRIEFS FOR MODERN PRACTICE

What is the most reliable method for diagnosing prostatic carcinoma?

Rectal palpation.

How accurate is it?

80% accurate.

Source—Malament, M.: J. M. Soc. New Jersey *54*:115, 1957.

in advanced prostatic carcinoma

STILPHOSTROL® TABLETS • AMPULS

Diethylstilbestrol Diphosphate, AMES

- Has "...an effect over and above ordinary estrogen therapy."[1]
- Relieves pain, diminishes urinary symptoms, promotes well-being.[1]
- "...easy and safe to give very large doses...intravenously or by mouth...."[2]

(1) Flocks, R. H.; Marberger, H.; Begley, B. J., and Prendergast, L. J.: J. Urol. *74*:549, 1955. (2) Flocks, R. H.: J.A.M.A. *163*:709 (Mar. 2) 1957.

Available: AMPULS: Boxes of 20. Each 5 cc. ampul contains diethylstilbestrol diphosphate 0.25 Gm. as a solution of the sodium salt. TABLETS: Bottles of 50. Each tablet contains diethylstilbestrol diphosphate 50 mg.

AMES COMPANY, INC • ELKHART, INDIANA

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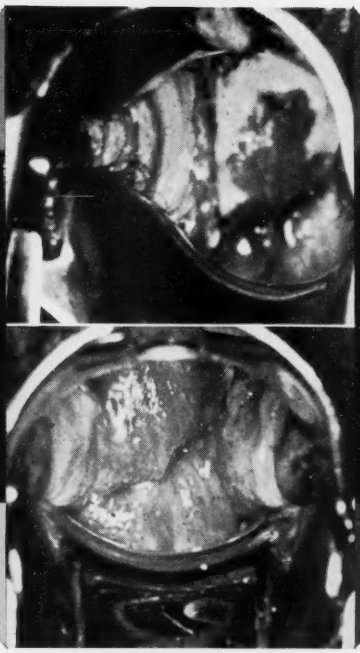
WHEN YOU
WANT EXCELLENT
RESULTS IN
MONILIAL
VAGINITIS



MYCOSTATIN
VAGINAL TABLETS

Squibb Nystatin

RESULTS:
"Of 96 patients with records suitable for tabulation, 85 had from good to excellent results."[1] In a group of 13 pregnant and 12 nonpregnant clinic patients "all patients were rapidly relieved of their symptoms, within 24 hours in most cases. . . . The writer has seldom been so rapidly convinced of the value of a new therapeutic agent."[2]

Mycostatin is the safe, highly effective antifungal antibiotic . . . with direct, specific action against monilia. When you use Mycostatin Vaginal Tablets for your patients with monilial vaginitis, your therapy can be 98.3% successful.[3] And your treatment will be clean—*without messiness or staining*—a point your patients will appreciate.

Each tablet contains 100,000 units of Mycostatin and 0.95 Gm. lactose. Packages of 15 with applicator; packages of 100 without applicator. Each tablet individually foil wrapped.

Therapy: 1 tablet intravaginally once to twice daily for 2 weeks, or as required.

You can also use Mycostatin Oral Tablets; Mycostatin Ointment; Mycostatin Dusting Powder; Mycostatin for Suspension.

1. Thomas, H. H.: Obstet. & Gynec. 9:163, 1957. 2. Browne, A. D. H.: J. Irish M.A. 40:86, 1957. 3. Pace, H. R., and Schantz, S. I.: J.A.M.A. 162:268, 1956.

"MYCOSTATIN"® IS A SQUIBB TRADEMARK

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SQUIBB QUALITY—
THE PRICELESS
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quiets the cough
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Expectorant action
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Promethazine Expectorant, Wyeth
With Codeine Plain (without Codeine)

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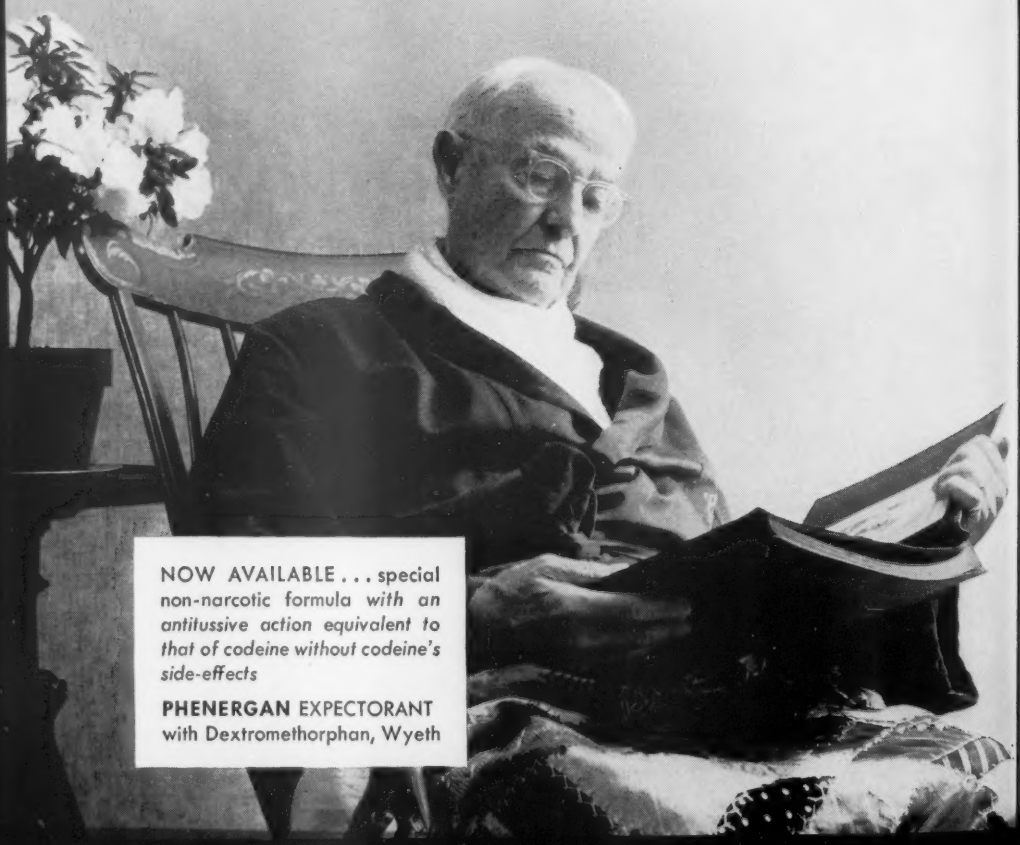

NOW AVAILABLE . . . special non-narcotic formula *with an antitussive action equivalent to that of codeine without codeine's side-effects*

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with Dextromethorphan, Wyeth

PYRIDIUM® RELIEVES PAIN PROMPTLY

BRAND OF PHENYLAZO-DIAMINO-PYRIDINE HCL)

fills the gap between complaint and correction of urinary tract disorders. In 20-25 minutes, Pyridium gives relief of urinary tract symptoms, even before the cause can be effectively treated. Diagnosis, antibacterial action or surgery may take time—but pain relief can be immediate with Pyridium, the standard urinary tract analgesic. **WARNER-CHILCOTT**

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PYRIDIUM® TRI-SULFA

(phenylazo-trisulfapyrimidine)

controls infection
relieves pain promptly
with only 1 tab. q.i.d.

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"...noteworthy effectiveness in cases of constipation induced or aggravated by anticholinergic and ganglionic blocking agents."*

*Gasster, M.: Med. Times, to be published.

STANDARD LA

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voids the colon

...naturally

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IMPORTANT THERAPY

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Specific Topical Benefits

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Hist-A-Cort-E™ pH 4.7

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INCORPORATED IN EXCLUSIVE ACID MANTLE® VEHICLE

ACID MANTLE® Hydrocortisone–
Estrone-Pyrilamine Maleate-Synthetic Vitamin A

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Epithelium Regenerative
Antiinflammatory
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Sig: Apply twice daily—Supply: 1 oz. tubes

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AND BETTER STORAGE

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The only homogenized vitamins in solid form

Homagenets are unusually palatable—and good taste is especially important to your patients. Of more interest to the physician is the homogenization process. This presents both oil and water soluble vitamins in microscopic particles. Thus the vitamins in Homagenets are better absorbed and utilized—and stored longer.[1] These are definite advantages to your patient.

1. *Lewis, J.M., et al.: J. Pediat.* 31:496.

THE ADVANTAGES OF HOMAGENETS

- Pleasant, candy-like flavor
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- Excess vitamin dosage unnecessary
- Longer storage in the body
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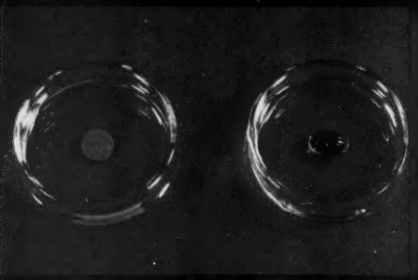
- May be chewed, swallowed or dissolved in the mouth.

Homagenets are available in five formulas: Prenatal, Pediatric, Therapeutic, Geriatric and Aoral (brand of vitamin A).

THE S. E. MASSENGILL COMPANY
Bristol, Tennessee

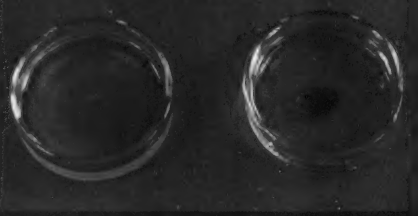
TURN THE PAGE for laboratory proof of the prompt dispersion of Homagenets

VISUAL PROOF OF THE RAPID DISPERSION OF HOMAGENETS®



1. Immediately after placement in Petri dishes.

2. Six minutes later.



3. Twelve minutes later.

4. Two hours and 12 minutes later.

These photographs show the dispersion time of a Homagenet and a soft gelatin capsule in artificial gastric juice at 37°C.

Homagenets are available in five formulas: Prenatal, Pediatric, Therapeutic, Geriatric and Aoral (brand of vitamin A).

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Write for samples and literature.

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relieve the symptoms of constipation

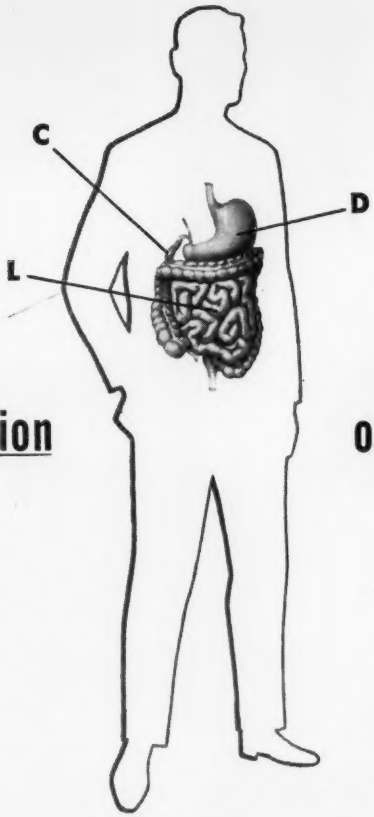
headache

malaise

gas and distention

bad breath

anorexia



treat the causes of constipation

faulty digestion

insufficient flow of bile

poor muscle tone

irregularity

Caroid and Bile Salts tablets help correct:

Faulty digestion – The enzyme, Caroid, improves protein digestion up to 15%.

Insufficient flow of bile – Bile salts increase the flow of bile to maintain normal water balance in the colon for soft, well-formed stools – and to improve fat digestion.

Poor muscle tone – Two gentle laxatives working synergistically provide mild stimulation of the upper and lower bowel.

Irregularity – Caroid and Bile Salts with its (D) digestant (C) choleretic (L) stimulant laxative action encourages return to normal daily bowel function.

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make it a routine practice to have only "regular" patients

Now *1* R_x

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2-dimensional
menopausal
therapy

manages both the psychic and somatic symptoms

relieves emotional stress in the menopause
and *treats* somatic disturbances due to ovarian decline

Milprem*

*TRADE-MARK

MILTOWN® A PROVEN TRANQUILIZER + CONJUGATED ESTROGENS (EQUINE) A PROVEN ESTROGEN

SUPPLIED: Bottles of 60 tablets.

EACH TABLET CONTAINS: Miltown® (meprobamate, Wallace) ..... 400 mg.
2-methyl-2-n-propyl-1,3-propanediol dicarbamate
Conjugated Estrogens (equine) ..... 0.4 mg.

DOSAGE: One tablet t.i.d. in 21-day courses with one week rest periods. Should be adjusted to individual requirements.

Literature and samples on request.

WALLACE LABORATORIES, *New Brunswick, N.J.*

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You can control tremor

In parkinsonism Parsidol has proved outstandingly effective for controlling tremor and muscular rigidity, the principal impairments in this disease.[1, 2]

With Parsidol most patients show rapid, even dramatic improvement—both in major symptoms and in gait, posture, balance and speech. Side effects are minimal. Parsidol is compatible with all other antiparkinsonian drugs and its effectiveness may even be increased in combination or rotation with such preparations as atropine and dextroamphetamine.[3] Parsidol improves the patient's emotional perspective, promotes a more optimistic outlook as physical coordination and dexterity return.

Most patients can be controlled with a maintenance dosage of 50 mg. four times daily. However, more severe cases may require up to 600 mg. daily, a dosage level ordinarily well tolerated.

References: 1. Doshay, L. J.; Constable, K. and Agate, F. J., Jr.: J.A.M.A. *160*:348 (Feb.) 1956. 2. Berris, H.: J.-Lancet *74*:245 (July) 1954. 3. Timberlake, W. H. and Schwab, R. S.: N. Eng. J. Med. *247*:98 (July 17) 1952.

PARSIDOL®

Brand of ethopropazine hydrochloride

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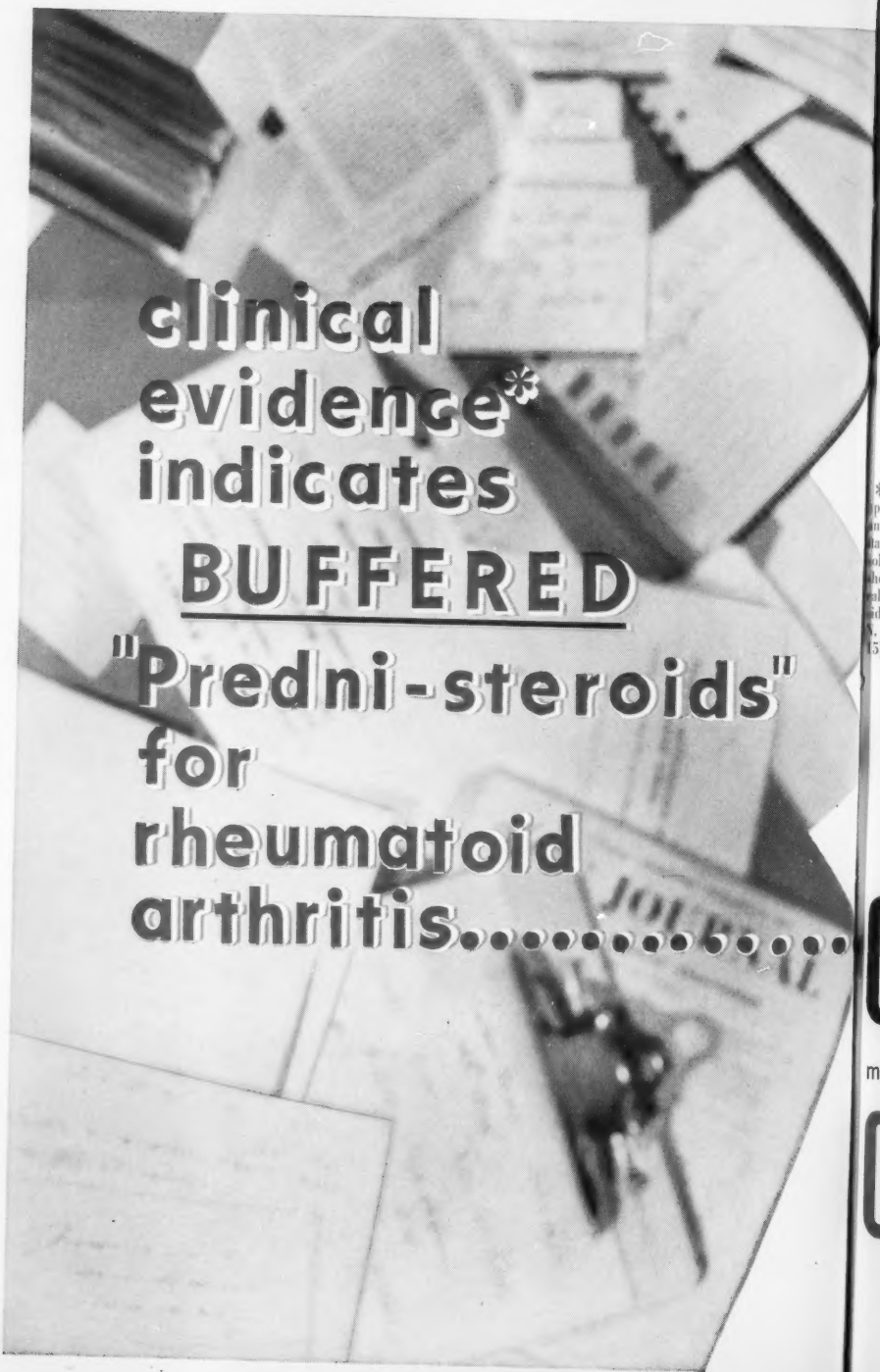

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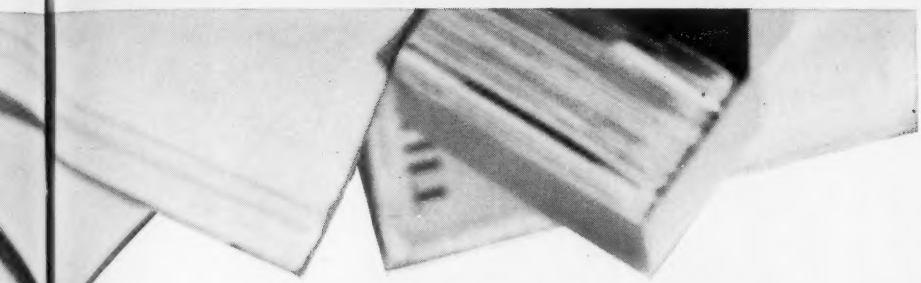

Gastric distress accompanying "predni-steroid" therapy is a definite clinical problem—well documented in a growing body of literature.

*"In view of the beneficial responses observed when antacids and bland diets were used concomitantly with prednisone and prednisolone, we feel that these measures should be employed prophylactically to offset any gastrointestinal side effects."—Dordick, J. R. *et al.*: N. Y. State J. Med. 57:2049 (June 15) 1957.

*"It is our growing conviction that all patients receiving oral steroids should take each dose after food or with adequate buffering with aluminum or magnesium hydroxide preparations."—Sigler, J. W. and Ensign, D. C.: J. Kentucky State M. A. 54:771 (Sept.) 1956.

*"The apparent high incidence of this serious [gastric] side effect in patients receiving prednisone or prednisolone suggests the advisability of routine co-administration of an aluminum hydroxide gel."—Bollet, A. J. and Bunim, J. J.: J. A. M. A. 158:459 (June 11) 1955.

One way to make sure that patients receive full benefits of "predni-steroid" therapy plus positive protection against gastric distress is by prescribing CO-DELTRA or CO-HYDELTRA.

Co-Deltra®

PREDNISONE BUFFERED

multiple compressed tablets

provide all the benefits of "Predni-steroid" therapy—plus positive antacid protection against gastric distress

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PREDNISOLONE BUFFERED

2.5 mg. or 5.0 mg. of prednisone or prednisolone, plus 300 mg. of dried aluminum hydroxide gel and 50 mg. magnesium trisilicate, in bottles of 30, 100, 500.

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iron your patients can tolerate

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iron-calcium TABLETS

a unique new compound, ferrous calcium citrate, with tricalcium citrate

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CARTRAX*

PETN + ATARAX®

(PENTAERYTHRITOL TETRANITRATE) (BRAND OF HYDROXYZINE)

why PETN? *For cardiac effect:* PETN is ". . . the most effective drug currently available for prolonged prophylactic treatment of angina pectoris."[1] Prevents about 80% of anginal attacks.

why ATARAX? *For ataractic effect:* One of the most effective—and probably the safest—of tranquilizers, ATARAX frees the angina patient of his constant tension and anxiety. Ideal for the on-the-job patient. And ATARAX has a unique advantage in cardiac therapy: it is anti-arrhythmic and non-hypotensive.

why combine the two? *For greater therapeutic success:* In clinical trials, CARTRAX was demonstrably superior to previous therapy, including PETN alone. Specifically, 87% of angina patients did better. They were shown to suffer fewer attacks . . . require less nitroglycerin . . . have increased tolerance to physical effort . . . and be freed of cardiac fixation.

1. Russek, H. I.: Postgrad. Med. *19*:562 (June) 1956.

Dosage and Supplied: Begin with 1 to 2 yellow CARTRAX "10" tablets (10 mg. PETN plus 10 mg. ATARAX) 3 to 4 times daily. When indicated this may be increased by switching to pink CARTRAX "20" tablets (20 mg. PETN plus 10 mg. ATARAX.) For convenience, write "CARTRAX 10" or "CARTRAX 20." In bottles of 100.

CARTRAX should be taken 30 to 60 minutes *before* meals, on a continuous dosage schedule. Use PETN preparations with caution in glaucoma.

NEW YORK 17, NEW YORK
Division, Chas. Pfizer & Co., Inc.

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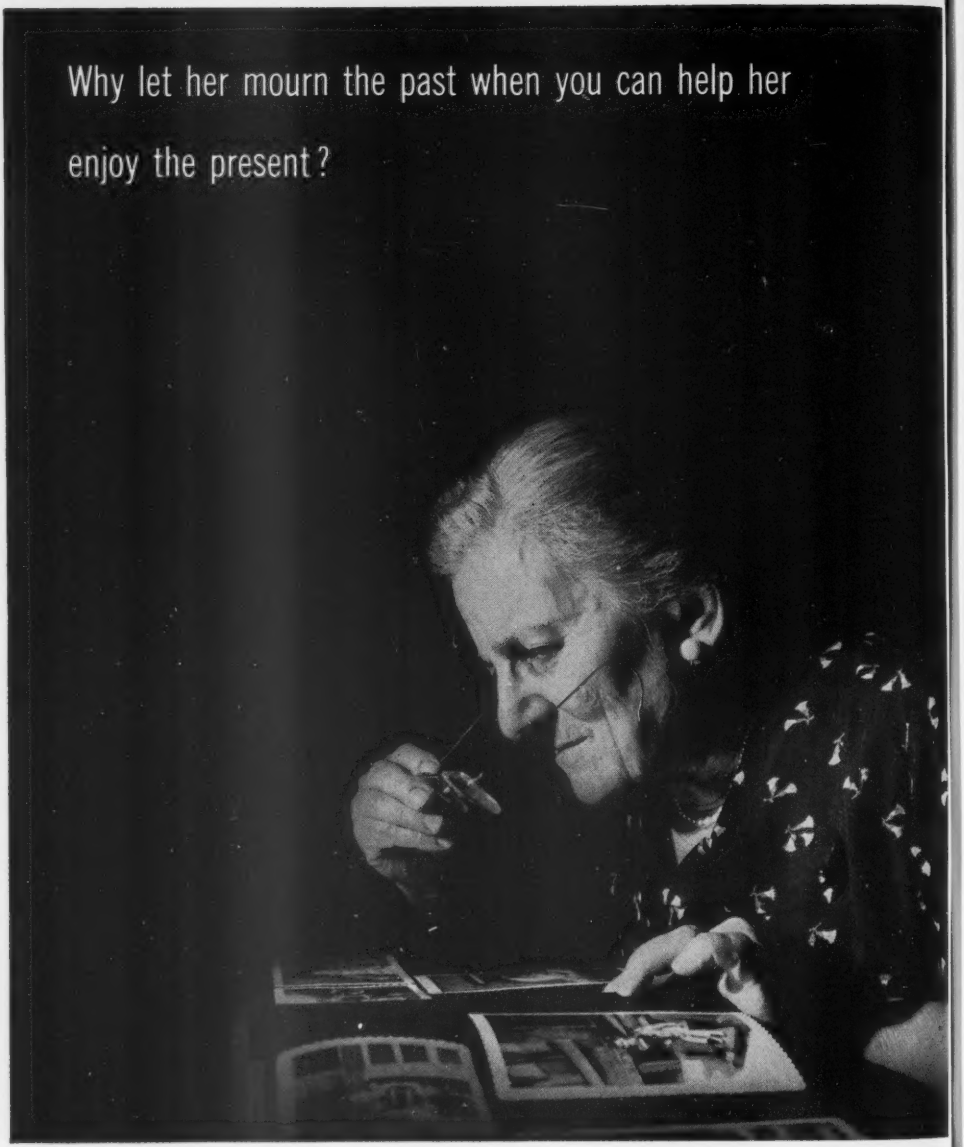
Why let her mourn the past when you can help her enjoy the present?



'Dexamyl' can help many elderly patients resume normal social and other beneficial activities, because 'Dexamyl'—smoothly and subtly —induces a sense of confidence, optimism and well-being. A combination of Dexedrine* (dextro-amphetamine sulfate, S.K.F.) and amobarbital, Dexamyl* is available as tablets, elixir and Spansule* sustained release capsules. Made only by **Smith Kline & French Laboratories, Philadelphia.**

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(Aqueous Suspension of Mineral Oil, Plain)

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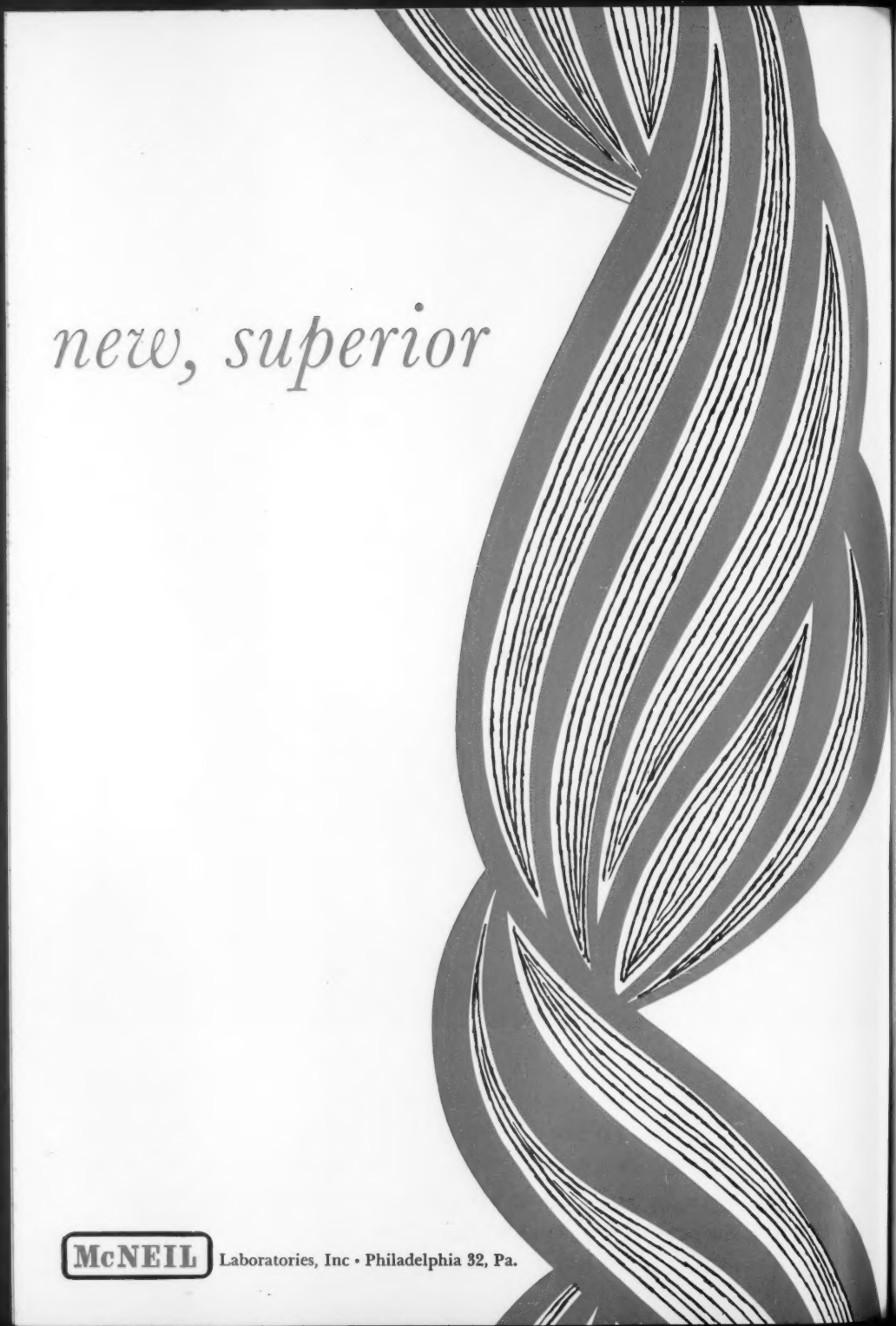


McNEIL Laboratories, Inc • Philadelphia 32, Pa.

SPECIFIC FOR PAINFUL MUSCLE SPASM

PARAFLEX*

Chlorzoxazone†

skeletal muscle relaxant

HIGHLY EFFECTIVE WITH PRACTICAL DOSAGE

in common traumatic, orthopedic, arthritic and rheumatic disorders, including: low back pain • sprains • strains • rheumatoid arthritis • osteoarthritis • spondylitis • myalgia • fibrositis • cervical root syndrome • wry neck • disc syndrome

EFFECTIVELY RELIEVES SPASM AND PAIN—In a controlled, double-blind study, marked improvement was reported in all but one of 15 patients treated with PARAFLEX.[1] Another investigator noted that symptoms were at least partially alleviated in all of the patients treated.[2]

PRODUCES LONG-LASTING BENEFITS—Significant blood levels following the administration of PARAFLEX are maintained for periods of 6 hours or more.[3] In most patients, the beneficial effects of PARAFLEX persisted for approximately six hours.[4]

AVERAGE DOSE—SIX TABLETS DAILY—With PARAFLEX, just one or two tablets, three times daily is an average effective dose. In experimental studies, PARAFLEX was found to be from one and one-half to three times as potent as other commonly used muscle relaxants.

IS WELL TOLERATED—Side effects are uncommon and seldom severe enough to require discontinuation of the drug.[5] Other clinicians have encountered few side effects to date.[1,2,4,6,7]

SUPPLIED—Tablets, scored, orange, bottles of 50. Each tablet contains 250 mg. of PARAFLEX.

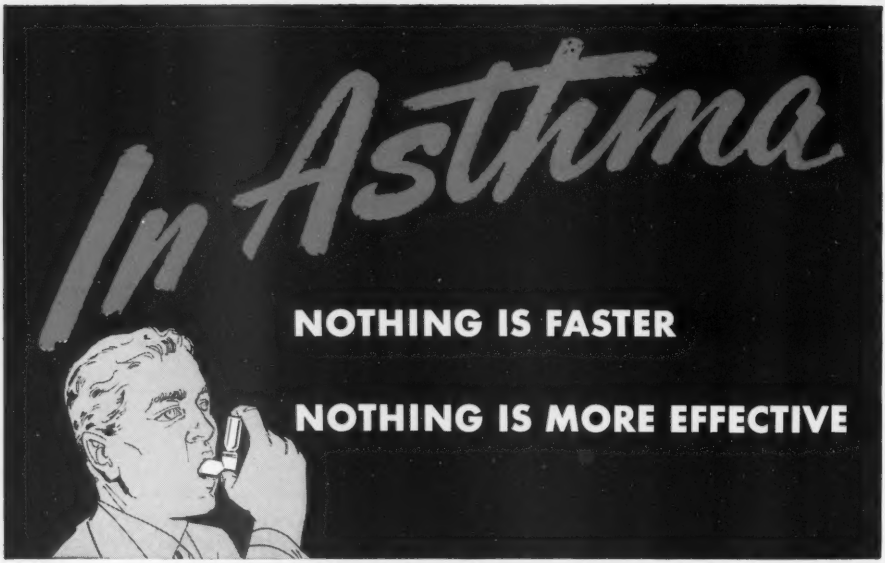
REFERENCES—(1) Settel, E.: Personal communication. (2) Holley, H. L.: Personal communication. (3) Burns, J. J.; Trousof, N., and Brodie, B. B.: To be published. (4) Smith, R. T.: To be published. (5) Peak, W. P., and Smith, R. T.: To be published. (6) Wiesel, L. L.: Personal communication. (7) Passarelli, W. W.: Personal communication.

CLINICAL RESULTS WITH PARAFLEX

Investigator	Disorder	Number of patients treated	Number of patients benefited	Comment
Settel[1]	acute low back pain, acute traumatic myofascitis, or osteoarthritis	15	14	response excellent in nine, good in five
Holley[2]	wry neck, cervical spondylitis, and disc syndrome	10	10	improvement, ranging from some amelioration of symptoms to profound relief
Wiesel[6]	advanced osteoarthritis	12	10	less muscle spasm and pain
Passarelli[7]	degenerative and rheumatoid arthritis	9	9	improvement, with less stiffness and freer motion
Passarelli[7]	varied arthritic rheumatic, and traumatic disorders	6	6	less stiffness, less pain
Totals		52	49	

*Trade-mark †U. S. Patent Pending

174A58



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Medihaler-EPI®

For quick relief of bronchospasm of any origin. More rapid than injected epinephrine in acute allergic attacks.

Epinephrine bitartrate, 7.0 mg. per cc., suspended in inert, nontoxic aerosol vehicle. Contains no alcohol. Each measured dose 0.15 mg. free epinephrine.

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Unsurpassed for rapid relief of symptoms of asthma and emphysema.

Isoproterenol sulfate, 2.0 mg. per cc., suspended in inert, nontoxic aerosol vehicle. Contains no alcohol. Each measured dose 0.06 mg. free isoproterenol.

MEDIHALER® *For Ample Air Right Now!*

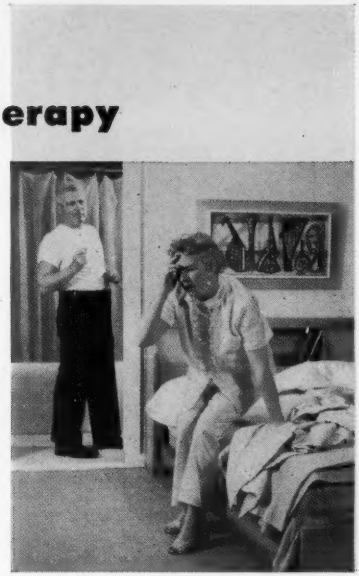
Millions of asthmatic attacks have been aborted faster, more effectively, more economically with Medihaler-Epi and Medihaler-Iso. Automatically measured dosage and true nebulization...nothing to pour or measure...One inhalation usually gives prompt relief.

Prescribe Medihaler medication with Oral Adapter as first prescription. Refills available without Oral Adapter.

The Medihaler Principle of automatically measured-dose aerosol medications in spillproof, leakproof, shatterproof, vest-pocket size dispensers also available in Medihaler-Phen® (phenylephrine, hydrocortisone, phenylpropanolamine, neomycin) for prompt, lasting relief of nasal congestion.

Riker LOS ANGELES

When hypotensive therapy may do more harm than good



A patient is not always fortunate enough to still be in bed when collapse occurs due to a precipitous drop in blood pressure. Such a collapse is a frequent hazard that accompanies the use of ganglionic blocking agents.

In contrast, Veralba-R lowers blood pressure without impairing vasomotor reflexes which guard against postural hypotension and help distribute blood volume according to physiologic needs.

Composition: Each grooved, uncoated Veralba-R tablet contains 0.4 mg. of chemically standardized protoveratrine and 0.08 mg. of reserpine. Supplied in bottles of 100.

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The action of aspirin is markedly improved by intermixture with the antacid MAALOX.® This combination is available on physicians' prescriptions as

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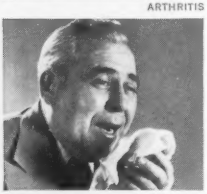
RORER

HEADACHE

ARTHRITIS



COLD

Each tablet contains:

ACETYLSALICYLIC ACID..... 0.30 Gm.
MAALOX..... 0.15 Gm.
(*Magnesium aluminum hydroxide gel*)

Note these advantages:

1. Within one hour, more than double the amount of salicylate appears in the blood stream.
2. Pain relief is felt twice as fast.
3. Gastric disturbance seldom occurs.
4. Pain relief lasts appreciably longer.

Prescribe ASCRIPTIN-Rorer for the pains and discomfort of arthritis, rheumatism, colds, grippe, headache, Asian Influenza, muscular aches and pains, etc. Your patients will be grateful.

Offered in bottles of 100 and 500 tablets.
Available at prescription pharmacies.
Liberal samples promptly on request.

Capsules ASCRIPTIN *with Codeine Phosphate 15 mg. also offered.*

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Documentary Case History . . .

Hypertension controlled for four years with Serpasil®

(reserpine CIBA)

K. C., a 67-year-old retired shirt manufacturer, had a 16-year history of hypertension, was troubled by recurrent dizzy spells and headaches. "I'd get several attacks a day. . . . Usually I'd go into the bedroom and lie down." Serpasil therapy was started four years ago, effecting a gradual reduction of the patient's initial blood pressure of 220/120 mm. to the present 140/80. Now well and asymptomatic, ". . . I'm able to go to matinees and see some of the TV shows."

SUPPLIED: TABLETS, 4 mg. (scored), 2 mg. (scored), 1 mg. (scored), 0.25 mg. (scored) and 0.1 mg.

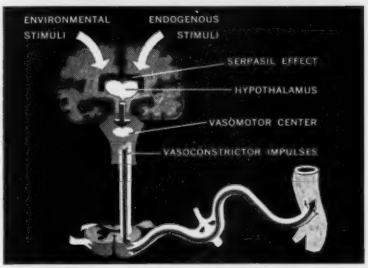
ELIXIRS, 1 mg. and 0.2 mg. Serpasil per 4-ml. teaspoon.

PARENTERAL SOLUTION: *Ampuls*, 2 ml., 2.5 mg. Serpasil per ml. *Multiple-dose Vials*, 10 ml., 2.5 mg. Serpasil per ml.

Hypertension controlled through

SYMPATHETIC REGULATION

Serpasil shields the psychic and somatic reaction centers from emotional and environmental stress stimuli, thereby inhibiting the discharge of vasoconstrictive impulses through the sympathetic nerves.



Adapted from Moyer, J. H., Dennis, E., and Ford, R.: Arch. Int. Med. 96:530 (Oct.) 1955.

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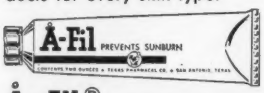
Most of your patients spend many hours in the sun during the summer months — either through choice or necessity. To help you help them enjoy freedom from uncomfortable, dangerous sunburning, the Texas Pharmacal Company offers a selection of sun protective products for every skin type.



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contains 5% menthyl anthranilate (menthyl **ortho**aminobenzoate) and 5% titanium dioxide in a vanishing cream type base tinted to blend with the natural skin coloring. Hypo-allergenic. To prevent sunburning **and** suntanning through complete chemical and physical protection from the sun.

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contains 3% digalloyl trioleate in a non-tinted vanishing cream type base which has emollient properties. Hypo-allergenic. To prevent sunburning and promote suntanning.

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contains 2½% digalloyl trioleate in a suitable base. Hypo-allergenic. To prevent sunburning of the lips and help prevent and relieve chapping.

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a special "cosmetic" package of Neo A-Fil, slightly more perfumed, and particularly acceptable to women patients.

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FOR A GOOD NIGHT'S SLEEP—
AND A FRESHER FEELING IN
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NOLUDAR

NOT A BARBITURATE

Acts promptly • essentially non-habit forming • broad safety margin • may be taken at bedtime or in the wee small hours for pre-dawn insomnia, with still an alert awakening at the desired hour.

DOSAGE:
two 200 mg tablets *gently but firmly* put the *confirmed insomniac* to sleep.
one 200 mg tablet lulls the *geriatric* patient to sleep.
one 50 mg tablet t. i. d. provides *daytime sedation* without drowsiness.

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MY DAD— HE HURT HIS BACK REAL BAD

"It happened at work while he was putting oil in something"

"He told Mom his shoulder felt like it was on fire"

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"But Doctor gave him some nice pills--and the pain went away fast"

"Dad said we'd play ball again tomorrow when he comes home"

AND THE PAIN WENT AWAY FAST

FOR PAIN

Percodan®

(Salts of Dihydrohydroxycodeinone and Homatropine, plus APC) **TABLETS**

ACTS FASTER...
usually within 5-15 minutes

LASTS LONGER...
usually for 6 hours or more

MORE THOROUGH RELIEF...
permits uninterrupted sleep through the night

RARELY CONSTIPATES...
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New "demi" strength permits dosage flexibility to meet each patient's specific needs. PERCODAN-DEMI provides the PERCODAN formula with one-half the amount of salts of dihydrohydroxycodeinone and homatropine.

AVERAGE ADULT DOSE: 1 tablet every 6 hours. May be habit-forming. Available through all pharmacies.

Each PERCODAN® Tablet contains 4.50 mg. dihydrohydroxycodeinone hydrochloride, 0.38 mg. dihydrohydroxycodeinone terephthalate, 0.38 mg. homatropine terephthalate, 224 mg. acetylsalicylic acid, 160 mg. phenacetin, and 32 mg. caffeine.

Literature? Write

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*U.S. Pat. 2,628,185

"'You are old, Father William,' the young man said,
'And your hair has become very white;
And yet you incessantly stand on your head—
Do you think at your age, it is right?'"

ALICE'S ADVENTURES IN WONDERLAND* DRAWING: JOHN TENNIEL, COURTESY GROSSET & DUNLAP

VASTRAN is the easy way

to dilate constricted intracranial vessels and increase circulation in older patients.

VASTRAN helps relieve fatigue by increasing intracranial circulation and improving cerebral nutrition, brings a comfortable sense of warmth and well-being. VASTRAN relieves elderly patients' cold hands and feet through warming peripheral vasodilating action of nicotinic acid.

VASTRAN also contains essential B-complex coenzyme factors and ascorbic acid to enhance cellular metabolism.

VASTRAN *is versatile:* Indicated in osteoarthritis, bursitis, myositis, fasciitis, tendinitis, peripheral neuritis, low back disorders and common strains. VASTRAN is also beneficial in intermittent claudication, Raynaud's disease, Buerger's disease, thromboangiitis, chilblains and cold hands and feet.

Each VASTRAN® tablet contains: nicotinic acid, 50 mg.; ascorbic acid, 100 mg.; riboflavin, 5 mg.; thiamine mononitrate, 10 mg.; pyridoxine hydrochloride, 1 mg.; cobalamin (vitamin B_{12} activity), 2 mcg.; calcium pantothenate, 5 mg.

Add Vastran to the over-all treatment of your aging patients.

Dosage: VASTRAN 1 tablet q.i.d. before meals.

VASTRAN AMP – more than injectable VASTRAN: In acute or severe conditions, start therapy with injectable VASTRAN AMP solution. Rapid vasodilation is complemented by adenosine-5-monophosphoric acid, as an aid in restoration of normal muscle function through increasing energy stores at the biochemical level. VASTRAN AMP contains in each cc.: nicotinic acid (as sodium salt), 20 mg.; adenosine-5-monophosphoric acid (as sodium salt), 25 mg.; and vitamin B_{12}, 75 mcg.

Note: VASTRAN tablets, for peripheral circulation impairment, are not to be confused with VASTRAN FORTÉ capsules, for hypercholesteremia.

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The mutual synergic relationship between mental perceptions of all kinds and body tone has been demonstrated.[1]

The combined central nervous and peripheral actions of ANALEPTONE improve *both* mental faculties and body tone. These actions commend its use in a wide range of disorders common to aged patients.

- CEREBRAL HYPOXIA
- CONFUSION
- APATHY
- ANTISOCIAL BEHAVIOR
- DEPRESSION
- LOSS OF MEMORY
- INABILITY TO CONCENTRATE

NOTE: No side effects are observed save for occasional and transient "niacin flush" in sensitive individuals.

1. Boernstein, W. S.: Tr. New York Acad. Sci. *20*:72, 1957.

ADDITIONAL REFERENCES: Smigel, J. O.: M. Times *85*:149, 1957; Levy, S.: J.A.M.A. *153*:1260, 1953; Thompson, L. J., and Procter, R. C.: North Carolina M. J. *15*:596, 1954; Erwin, H. J.: Missouri Med. *53*:1071, 1956.

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ANALEPTONE ELIXIR

Each teaspoonful (4 cc) contains:

Pentylenetetrazol	200 mg.
Niacin	100 mg.
Peptenzyme® Elixir	q.s.

SUPPLIED: Bottles of 8 fl. oz.

ANALEPTONE TABLETS

Each tablet contains:

Pentylenetetrazol	100 mg.
Niacin	50 mg.
Pepsin 1:10,000	5 mg.

SUPPLIED: Bottles of 100.

DOSAGE: One-half to one teaspoonful of Elixir; one to two tablets, 1 to 3 or 4 times daily.

and now **HIGH POTENCY CORTICOID CONTROL**

whenever oral therapy is impractical

in high dosage therapy
in patients undergoing surgery
in the severely ill or debilitated
in presence of vomiting, coma
& in the presence of shock

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STERANE® I.M.

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the first high potency corticoid designed specifically for intramuscular use

provides rapid therapeutic concentration • precise dosage control • no local irritation reported • most convenient form whenever oral corticoids are impractical, unacceptable • for hospital or office use

Supplied: In vials of 5cc., each cc. containing 25 mg. prednisolone acetate (STERANE) in aqueous suspension.
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when you treat hypertensive patients

double duty RAUDIXIN

Squibb Standardized Whole Root Rauwolfia Serpentina

is the solid base line for successful therapy

Raudixin helps you relieve pressures in your patients

Raudixin "lowers blood pressure and slows the pulse rate much more efficiently than the barbiturates. . . . It is not habit-forming and is synergistic with all other known hypotensive drugs."*

Raudixin helps you relieve pressures on your patients

Raudixin "relieves anxiety and tension, particularly the tension headache of the mild hypertensive patient, better than any other drug."*

RAUDIXIN..."is the best symptom reliever."*

In mild to moderate cases, Raudixin is frequently sufficient.

Base line therapy with Raudixin permits lower dosage of more toxic agents. The incidence and side effects of these agents are minimized. Diuretics often potentiate the antihypertensive effect of Raudixin.

*Finnerty, F. A. Jr.: New York State J. Med. 57:2957 (Sept. 15) 1957.

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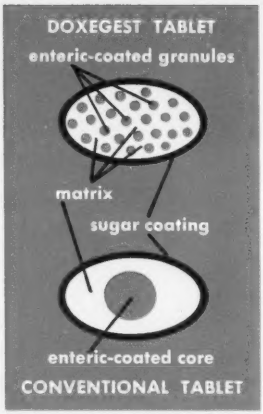
DOXEGEST DI-PHASIC TABLETS "feature" a unique method of manufacture in that "enteric-coated granules" of pancreatin and hemicellulase are dispersed throughout the entire matrix rather than being contained in a single conventional enteric-coated core. The tiny granules mix thoroughly with the stomach's contents. They are dispersed uniformly and broken down readily when ejected into the alkaline medium of the duodenum and small intestine.



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. . . comprehensive digestive enzyme replacement

FORMULA: Each DOXEGEST DI-PHASIC tablet contains betaine HCL 65.0 mg.; papain 15.0 mg.; ketocholanic acid 12.5 mg.; desoxycholic acid 32.5 mg.; pancreatin (triple strength) 87.5 mg., equivalent to 262.5 mg. U.S.P.; and hemicellulase 25.0 mg.

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simple ... safe ... effective ...

For the alleviation of symptoms in bronchial asthma and the acute episodes of heart failure, CLYSMATHANE (Fleet) supplies prompt therapeutically adequate blood levels of theophylline.[1]

Even after repeated dosage CLYSMATHANE (Fleet) minimizes the side effects often associated with oral or parenteral theophylline administration. The plastic squeeze bottle (with attached, prelubricated, non-traumatic rectal tube) is designed for self-administration.

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Composition: Theophylline monoethanolamine (Theamin, Fleet) 0.625 Gm. aqua 37.0 ml. in rectal dispenser. Units packed in individual cartons, manufacturer's label readily removable.

REFERENCE: (1) Ridolfo, A. S. & Kohlstaedt, K. G., "A simplified method for the rectal instillation of theophylline"—to be published

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Disposable Rectal Unit

since 1889 Fleet

Professional Samples and literature on request

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'DIURIL'

(CHLOROTHIAZIDE)

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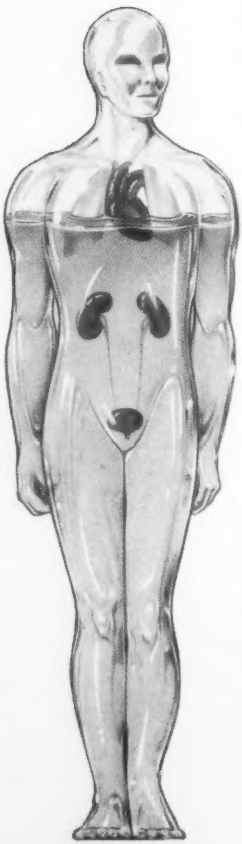
EDEMA



Start therapy with one or two 500 mg. tablets of 'DIURIL' once or twice a day.

BENEFITS:

- The only orally effective nonmercurial agent with diuretic activity equivalent to that of the parenteral mercurials.
- Excellent for initiating diuresis and maintaining the edema-free state for prolonged periods.
- Promotes balanced excretion of sodium and chloride—without acidosis.

Any indication for diuresis is an indication for 'DIURIL':

Congestive heart failure of all degrees of severity; premenstrual syndrome (edema); edema and toxemia of pregnancy; renal edema—nephrosis; nephritis; cirrhosis with ascites; drug-induced edema. May be of value to relieve fluid retention complicating obesity.

SUPPLIED: 250 mg. and 500 mg. scored tablets 'DIURIL' (chlorothiazide); bottles of 100 and 1,000.

'DIURIL' and 'INVERSINE' are trade-marks of Merck & Co., Inc.

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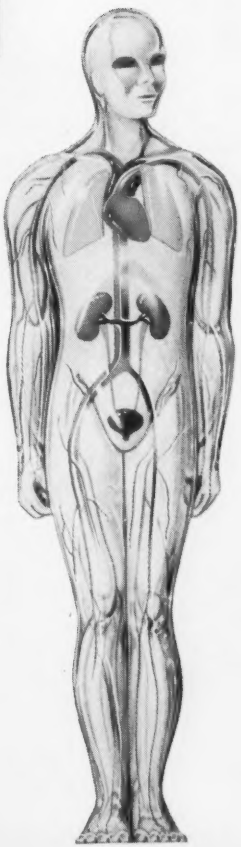
as simple
as 1-2-3
in

HYPERTENSION



1 INITIATE 'DIURIL' THERAPY

'DIURIL' is given in a dosage range of from 250 mg. twice a day to 500 mg. three times a day.

2 ADJUST DOSAGE OF OTHER AGENTS

The dosage of other antihypertensive medication (reserpine, veratrum, hydralazine, etc.) is adjusted as indicated by patient response. If the patient is established on a ganglionic blocking agent (e.g., 'INVERSINE') this should be continued, but the total daily dose should be *immediately* reduced by 25 to 50 per cent. This will reduce the serious side effects often observed with ganglionic blockade.

3 ADJUST DOSAGE OF ALL MEDICATION

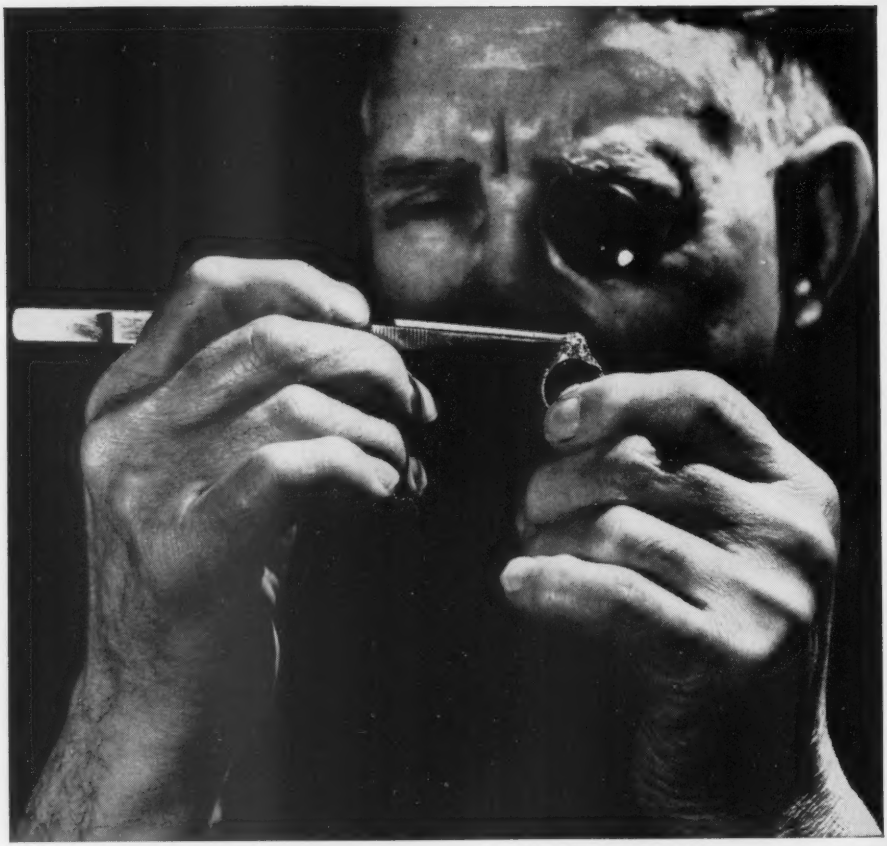
The patient must be frequently observed and careful adjustment of all agents should be made to determine optimal maintenance dosage.

BENEFITS:

- improves and simplifies the management of hypertension
- markedly enhances the effects of antihypertensive agents
- reduces dosage requirements for other antihypertensive agents—often below the level of distressing side effects
- smooths out blood pressure fluctuations

INDICATIONS: management of hypertension

Smooth, more trouble-free management of hypertension with 'DIURIL'



release from pain and inflammation

with **BUFFERIN.® IN ARTHRITIS**

salicylate benefits with minimal salicylate drawbacks

Rapid and prolonged relief—with less intolerance.

The analgesic and specific anti-inflammatory action of BUFFERIN helps reduce pain and joint edema—comfortably. BUFFERIN caused no gastric distress in 70 per cent of hospitalized arthritics with proved intolerance to aspirin. (Arthritics are at least 3 to 10 times as intolerant to straight aspirin as the general population.[1])

No sodium accumulation. Because BUFFERIN is sodium free, massive dosage for prolonged periods will not cause sodium accumulation or edema, even in cardiovascular cases.

Each *sodium-free* BUFFERIN tablet contains acetylsalicylic acid, 5 grains, and the antacids magnesium carbonate and aluminum glycinate.

Reference: 1. J.A.M.A. 158:386 (June 4) 1955.

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FOR COMMON COMPLAINTS

in hyperacidity

TITRALAC®

unique antacid—
with milk-like action

Gives fast relief that lasts for hours in hyperacidity and peptic ulcer. Two delicious tablets, or one teaspoonful of liquid, provide buffering action equal to ½ pint of milk "... without the latter's actual and potential disadvantages."* No systemic alkalosis, constipation, or laxation.

Each minty-tasting, non-chalky *white* tablet (0.60 Gm.) contains 0.18 Gm. glycine and 0.42 Gm. calcium carbonate. TITRALAC Liquid—each 5-cc. tsp. contains 0.30 Gm. glycine and 0.70 Gm. calcium carbonate.

*Cornell, A.: Gastroenterology *31*:505, 1956.

TITRALAC, DORBANTYL, AND SEDAMYL ARE REGISTERED TRADEMARKS OF SCHENLABS PHARMACEUTICALS, INC. TITRALAC PATENTED FORMULA. DORBANTYL FORMULA PATENT PENDING. 46657

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SCHENLABS PHARMACEUTICALS, INC.

in constipation

DORBANTYL®

peristaltic stimulant—
fecal softener

Promotes prompt re-establishment of normal bowel activity and regularity by combining the selective peristaltic action of synthetic, crystalline-pure DORBANE® (1, 8-dihydroxyanthraquinone) and the wetting action of dioctyl sodium sulfosuccinate, in proportions proved optimal by clinical trial.* Noncumulative and nonhabituating.

Each DORBANTYL Capsule and each 5-cc. tsp. of DORBANTYL Suspension contains DORBANE, 25 mg., and dioctyl sodium sulfosuccinate, 50 mg. Each DORBANTYL *Forte* Capsule contains 100 mg. dioctyl sodium sulfosuccinate and 50 mg. DORBANE—equivalent to two regular DORBANTYL Capsules.

*Marks, M. M.: Clin. Med. *4*:151, 1957.

in nervous tension

SEDAMYL®

calms without confusing

Antitensive that "... acts on the higher centers of the brain to produce a tranquilizing and calming action without the drowsiness or hypnosis of the barbiturates."* And unlike the meprobamates, it is free from the depressant effect on multineural reflexes.*

Each SEDAMYL Tablet contains 0.26 Gm. (4 gr.) acetylbromdiethylacetylcarbamid.

*Hughes, E. W.: J. Indiana M. A. *50*:293, 1957.

Fats contain a wide variety of fatty acids. Certain of these fatty acids are called "essential" . . . essential to the body for functioning in some vital and specific role . . . essential in foods because the body cannot synthesize them.

These "essential" fatty acids are called arachidonic and linoleic. Arachidonic acid is found only in animal fats . . . and is believed to be the functional fatty acid specifically required in cell metabolism. Linoleic and a related acid, linolenic, are found in vegetable oils. Linoleic acid is readily converted to arachidonic acid in the body. All these acids are easily destroyed by oxidation or hydrogenation.

Different fats contain different amounts of "essential" fatty acid. While unprocessed vegetable oils contain larger quantities than do animal fats—when hydrogenated, their "essential" fatty acid content may be similar to that found in animal fats.

In the body, "essential" fatty acids are found in vital organs such as kidney, heart and liver. They have been shown to be dietary essentials for many species of animals . . . and recent evidence from studies with infants suggests they may be dietary essentials for man as well. Animals fed diets deficient in "essential" fatty acids cease to grow . . . lose hair . . . develop dry and scaly skin which is permeable to water . . . show kidney damage . . . become sterile . . . and die prematurely. There is indication that "essential" fatty acids are involved with cholesterol metabolism . . . or transport for an "essential" fatty acid deficiency develops more rapidly in experimental animals when the metabolism of cholesterol is increased . . . by feeding excess cholesterol . . . or by making the animal diabetic or hypothyroid.

Fat, as present in foods and used in meal preparation, contributes to the pleasure of eating, and to the "essential" fatty acid intake.

Since 1915 . . . promoting better health through nutrition research, education

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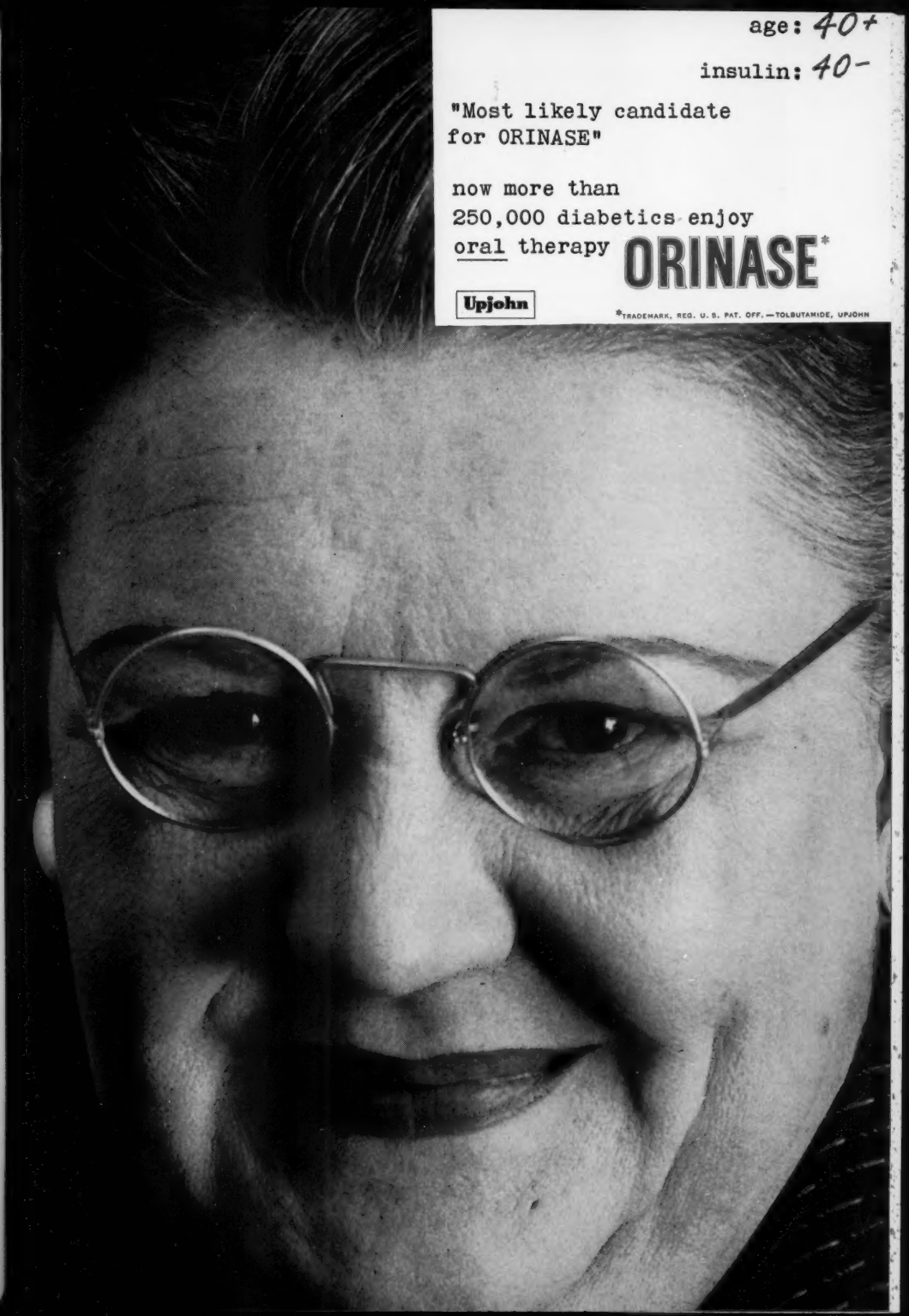
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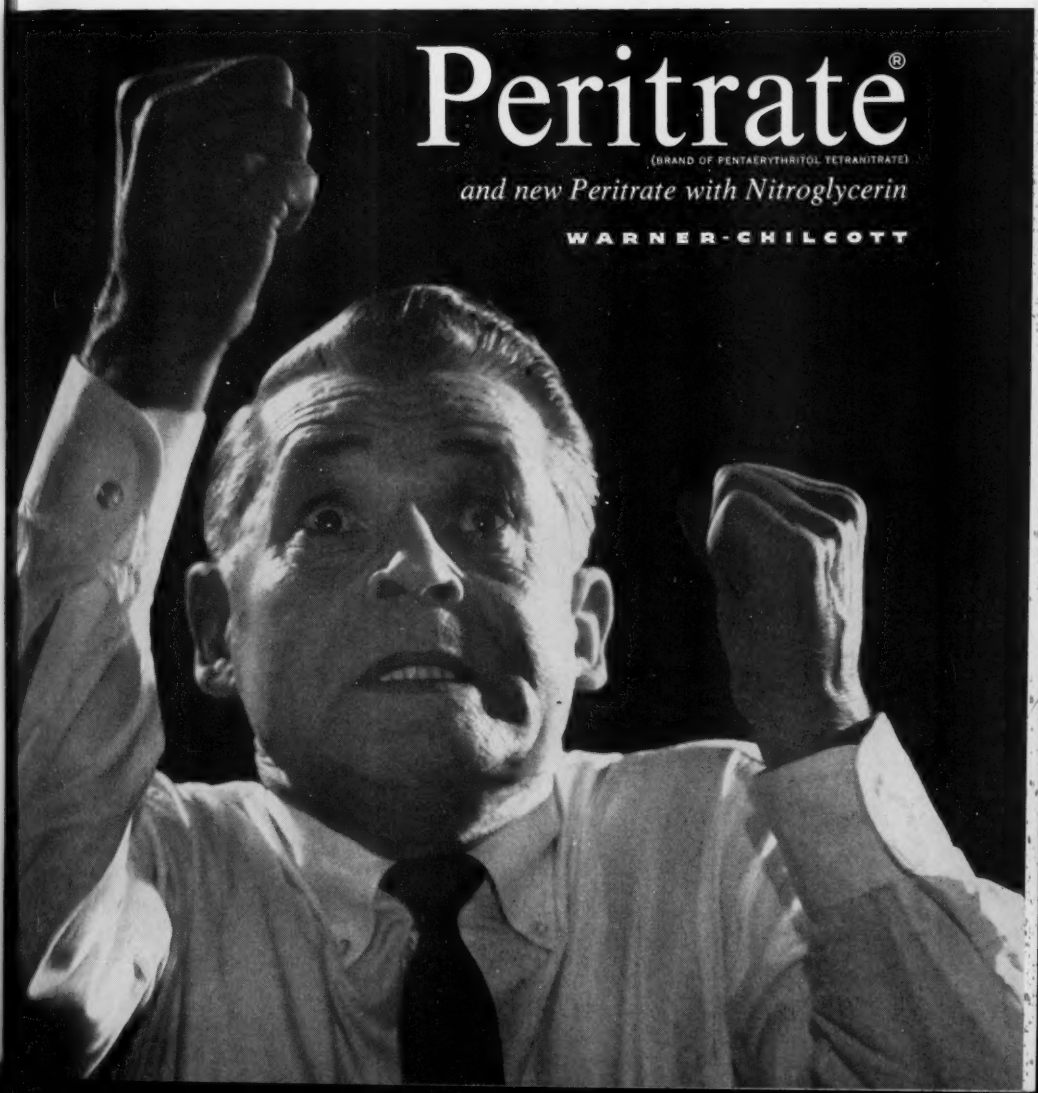

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(1) Hagedorn, A. B.: Proc. Staff Meet. Mayo Clin. **32**:705 (Dec. 11) 1957.
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A SYMPOSIUM *on geriatrics*

The Hahnemann Medical College

Introduction

Geriatrics as a medical specialty

It has become a popular practice to consider geriatrics as a separate medical specialty, much as one would separate internal medicine from the surgical specialties. However, it appears that there are few outstanding arguments to support such a concept. The practice of medicine in the young adult and the elderly adult presents quantitative differences but not qualitative ones. The geriatric patient does not become a completely different organism just because he has gotten older.

When should a patient be considered a geriatric patient? As one reads these papers presented by members of the staff of the Hahnemann Medical College, specifically written by a group of internists who have given special thought and effort to treating elderly patients, it becomes evident that, with minor deviations, the disease process and its therapy are essentially the same in the older patient as in the younger individual. For example, the authors suggest that the indications for treatment of older patients with diastolic hypertension are little different from those of similar patients in the younger age group. Treatment of pernicious anemia is similar for the young and the old. The principles of therapy for arthritis, diabetes, and heart failure are basically the same irrespective of age.

Nevertheless, there are subtle problems peculiar to the aged. It is the internist who appraises and understands these subtleties who becomes the expert in treating elderly patients. Thus the therapist must understand the aging

process as a natural sequence of events which follows in the wake of a more kinetic period in the life of man. The aging process is not an event by crisis but rather it is a slow transition from the mature youth to the time-worn old man.

Comprehension of medical problems presented by the geriatric patient requires a sound understanding of the fundamentals of good medicine. Although there are minor peculiarities in the clinical manifestations and therapy of diseases in old persons, medicine is at its best when based on good fundamentals, irrespective of the chronologic age of the patient to whom these principles are being applied. With a sound understanding of basic concepts, the clinician is better able to adapt to the minor deviations associated with the patient who is advanced in years. As the therapist gains experience in the treatment of elderly patients, he naturally becomes better acquainted with minor deviations peculiar to age and thus can cope more efficiently with the specific problems. Herein lies the specialty of geriatric medicine when properly practiced.

It is with this attitude of mind that we hope to develop medical geriatrics at the Hahnemann Medical College. It is anticipated that some of the qualified internists from each of the general medical sections, as well as the subspecialties, will develop special interests and proficiencies in treating elderly patients. It is not our objective to develop an isolated section of geriatric medicine which is a superspecialty separate and apart from the general internal medical section and its subspecialties.

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The Surgical Treatment of Mitral and Aortic Stenosis in Patients Over 55

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Principles of Sound Nutrition in the Aged

NOTE OF APPRECIATION

My satisfaction in this issue of *Geriatrics* is of a special order for two reasons. First, all of the articles have been contributed by members of the faculty of which I have the honor to be Dean. Second, as an advisory editor I have had much pleasure in observing the spirited interest shown by everyone who was invited to participate: their enthusiasm has confirmed again my conviction of the importance of gerontology in medicine today.
Charles S. Cameron, M.D.

The problem of atherosclerosis: a brief review

JEROME M. WALDRON, M.D.
PHILADELPHIA

In a brief review of the problem of atherosclerosis, it is pointed out that much confusion exists in the use of the term atherosclerosis for acute processes which may not be related to atherosclerosis. The suggested therapies such as low-fat diet, low-cholesterol diet, unsaturated fat substitution, and so on do not offer any significant measure of success. The answer to the problem of atherosclerosis awaits further research.

◆ In recent years, much has been written on atherosclerosis. The reports range from fundamental to clinical studies. However, the volume of papers makes it impossible for one not primarily interested in the problem to keep abreast. In any review of the literature, it soon becomes apparent that there is much confusion about atherosclerosis. This confusion is not restricted to concepts of etiology, pathogenesis, or treatment. The term atherosclerosis has a different meaning in different papers. Some studies are concerned only with the problem of coronary occlusion, which may or may not be related to atherosclerosis. Nevertheless, patients with this condition are considered as part of the problem of atherosclerosis. The same approach is also used in reports on cerebrovascular accidents and in peripheral vascular disease.

Another error is the use of the term atherosclerosis for an acute episode in place of the chronic process. Again, this is evident in reports on coronary occlusion. Nonfatal myocardial infarction cannot be unequivocally classed as coronary atherosclerosis; it may be the result of thrombosis in an area where there is no atherosclerosis. In addition, the conditions which produce acute episodes in an atherosclerotic vessel may have no relation to the condition producing the chronic process of atherosclerosis.

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This careless use of the term leads to errors in statistics on the incidence of the disease and clouds the interpretation of reported studies. The reported incidence is also probably higher than the actual incidence, because the vast literature on the subject has made it a popular diagnosis. It is true that some of the diagnoses cannot be substantiated objectively. In most instances, the diagnosis of arteriosclerotic disease in the living patient is one of exclusion. Undoubtedly atherosclerosis may be found in the patient because it has been shown that these changes are found in the vessels of asymptomatic young people.

In this article, the term atherosclerosis will be used in the pathologic sense without respect to the location unless specifically stated. The pathologic diagnosis of early atherosclerosis is of no clinical importance except in studies of etiology or pathogenesis; it produces no clinical picture. The progression of these lesions to large ones of marked lipid accumulation

or fibrous plaques with little lipid or the centrally necrotic atheroma is what is usually meant when one speaks of clinical atherosclerosis. The absolute size of the lesion is not as important as the size in relation to the size of the vessel in which it is located as well as the vessel involved.

With these definitions, it is possible to proceed to a discussion of treatments recommended for patients with atherosclerosis. Of necessity, we must consider treatment of acute and chronic cases. Since there is no evidence that atherosclerotic lesions will retrogress under any form of therapy available today, the problem settles down to one of prevention and treatment of acute episodes and the prevention of the chronic process. Since atherosclerosis begins in early life, prevention must start in infancy. In the older patient, one can only hope to prevent progression.[1]

Diet and Atherosclerosis

The most popular concept today is that atherosclerosis is primarily related to diet. This is based on (1) the correlation of a high serum cholesterol in most patients with atherosclerosis; (2) the experimental production of atherosclerosis in animals by feeding cholesterol; (3) the fatty character and cholesterol content of the atherosclerotic lesions; and (4) epidemiologic studies of correlation of coronary artery disease and diet. Acceptance of each of these relationships builds a good case for diet as a cause of atherosclerosis, but each observation is open to serious objection. A thorough review of each of these problems is not possible in this space, but a few questions will be raised.

CORRELATION WITH HYPERCHOLESTEROLEMIA

The correlation of a hypercholesterolemia in patients with atherosclerosis is only a correlation and not an absolute index. Many patients with severe atherosclerosis do not have an elevated serum cholesterol. In addition, the correlation of a high cholesterol level is with patients whose atherosclerosis is in a location or of a severity to cause clinical morbidity. In most of the patients with a "normal" cholesterol, one will find atherosclerotic changes. How can we feel we have accomplished anything by lowering serum cholesterol to normal? This will not be prevention.

EXPERIMENTAL ATHEROSCLEROSIS

Interest in cholesterol as a cause of atherosclerosis was accentuated by the experimental production of the lesions in animals on a cholesterol diet. This was a tremendous advance because it offered a tool whereby controlled studies of the pathogenesis could be systemically studied. Although the individual lesions are similar to those of human atherosclerosis, their distribution is not. For example, it is rare for atherosclerosis to be present in cerebral vessels in experimental animals, whereas this is common clinically. In the experimental animal, the cells of the reticuloendothelial system and parenchymatous organs show an accumulation of lipids, whereas this is not true in the human counterpart. Also, in most animals, some additional factor such as thyroidectomy must be added to the factor of an abnormally excessive cholesterol intake in order to produce the lesion. Thus, the direct transfer of these studies in animals to the human problem is not completely warranted.

EPIDEMIOLOGIC RELATIONSHIP

Another popular argument is that there is an epidemiologic relationship of diet to atherosclerosis. If one accepts, without contest, the reported data, one can only say that there is a correlation of some significance but no definite causal relationship. For this study, such data cannot be accepted without con-

test.[2] First, the incidence of atherosclerosis in each country varies, depending on how the data are collected. The problem of the true incidence and confusion with terms such as coronary occlusion and cerebrovascular disease has already been discussed. The data may also be contested on the basis of the determination of a national diet. The amount of fat consumed in a country cannot be determined by a balance sheet from the Department of Commerce. One must evaluate the size of garbage pails, the variety of cooking technics, and many other factors. Even if the data are accepted as reported, one cannot conclude that the difference in incidence of atherosclerosis in different countries is a result of diet. This has been done by good investigators who know that in any experiment only one factor should be variable. In the difference of nations there are many variables in addition to diet that cannot be overlooked or dismissed.

RELATIONSHIP OF FOODSTUFFS

An important consideration is the relationship of foodstuffs. If it could be shown that a high-fat diet was related to atherosclerosis, it might be the high fat in the diet or the low carbohydrate. Since protein consumption in the United States remains fairly constant for years and for various economic strata, variations in fat intake mean a reciprocal change in carbohydrate. Perhaps a deficiency of carbohydrate rather than excess of fat is the important factor. Because of the preoccupation with fat, this facet is not discussed or investigated. Another problem along the same line is the effect of the metabolism of one foodstuff or another. Recent evidence has shown that lipid metabolism is definitely affected by carbohydrate metabolism in diabetes.[3] Similarly, it has been shown that, although there is an increase in beta-lipoproteins in patients with atherosclerosis, there is also a decrease in the amount of protein in the alpha-lipoproteins.[4] Which comes first? Perhaps a primary change in protein metabolism produces the secondary change in serum lipids, a subject currently engaging all of our attention.

This discussion is pertinent, whether one is considering control by low-fat diet, low-cholesterol diet, or the use of unsaturated fats as substitutes or supplements. In short-term experiments, each of these can be shown to lower serum lipids, but the experiments are often unrelated to practical living. They are often based on formula feedings or such restricted diets as to be impractical. It has never been shown that the low-fat or low-cholesterol diet has made anyone live any longer; it just makes it seem longer.

The present review is stressing the faults of the diet hypothesis in the pathogenesis of atherosclerosis because too much has been written on the correlation. This is not to deny a specific relationship either direct or indirect, but there are other avenues of approach and thinking. The question should be decided with facts and not fancy. To the author, there are only three reasons for using the low-fat, low-cholesterol, or unsaturated-fat diet.

From a scientific standpoint, a good, long term study should be done to settle this question because, although an attempt has been made to put sense in dietary recommendations,[2] this problem of low-fat diet will remain with us. From the pragmatic viewpoint of the practicing physician, it does offer "something to tell the patient." It also leaves an escape route. Since most patients will not completely adhere to a strict low-fat diet, the physician can blame any complication on the patient's indiscretion. The third reason depends on individual religious philosophy. Although the low-fat diet may not help the patient in this life, it will benefit him in the next since it is a form of penance.

Hormones and Vitamins

Other variants are the differences in the incidence of atherosclerosis between the sexes and in patients with endocrine disturbances such as hypothyroidism or diabetes mellitus. The obvious answer for the latter two is the treatment of the basic disease. Nevertheless, this has led to studies on the role of hormones in the pathogenesis of the disease. This is a virgin field and undoubtedly much is to be contributed from it because of the basic relation of hormones to metabolism of the primary foodstuffs. The problem of hormones has recently been adequately reviewed.[5] At present there is nothing available for therapeutic use. The most dramatic effect in experimental animals has been with the use of estrogens. In clinical practice, these are of no significance because of the changes associated with the use of female sex hormones.

Recently interest has been raised in the possible role of vitamins in the treatment of atherosclerosis or more specifically in the lowering of serum cholesterol. There is no evidence that the disease is due to a vitamin deficiency. If vitamins are used, they are used for pharmacologic effect and not for replacement effect. Adequate data are not available for complete evaluation of the value of vitamins in therapy. Even in this field confusion already exists. Some of the reports quoted are concerned with hypercholesterolemic diseases and not necessarily with atherosclerosis.

Blood Coagulability

The importance of blood coagulation in the pathogenesis of atherosclerosis has been suggested. This is based on the fact that feeding fat accelerates the rate of blood coagulation.[6] This occurs fairly rapidly after feeding a pure fat meal but here the relation of other foodstuffs is shown because the simultaneous feeding of sugar mitigates this clot-accelerating effect.[7] It is postulated that repeated episodes due to high-fat diet lead to subclinical clotting with fibrin deposition in or on the artery. This offers a nidus for the atherosclerotic process to begin. The concept is based on a prevalent idea that the conversion of fibrinogen to fibrin occurs only in response to acute episodes. This idea cannot be positively challenged but it has been also suggested that the conversion of fibrinogen to fibrin is a constant process[8] and that this fibrin is readily destroyed. If the last concept is true, the first concept loses much weight.

The problem of blood coagulation is more closely related to an acute complication in a chronic disease. It is often a sudden thrombus in an old arteriosclerotic coronary artery that leads to an infarction. Here the feeding of fat may have real significance because of the clot-accelerating property of fat. Even in this instance, it is not the question of the amount of fat in a mixed diet, but the ingestion of fat alone as in milk or cream or egg yolks; therefore, its value to the average diet is open to question. It is of importance, however, in special diets such as a strict Sippy regime in an older person. An increased incidence of coronary occlusion has been reported in older patients on an ulcer diet. It would also apply to abnormal dietary indiscretions such as eating a lot of ice cream before going to bed. Since other foodstuffs, particularly carbohydrate, mitigate the effect of fat, it is better to eat a sundae than plain ice cream as far as blood coagulation occurs.

Some writers on this subject have taken this observation of the acute effects of fat on blood coagulation and used it as evidence for the low-fat diet. This is unwarranted. The same reasoning is also used for other acute effects of fat such as possible hypoxia from lipids in the peripheral stream, sludging of the blood, or slowing circulation. All of these have

been reported as effects of fat in acute experiments in animals. These acute experiments cannot be translated into the pathogenesis of the chronic disease. In order to produce some of the effects reported, amounts of fat consumed by experimental animals in one feeding exceeded the total daily caloric intake of a stevedore. Needless to say, many of these investigations cannot be interpreted in relation to human experience.

Evaluation of Treatment

It is impossible to review all of the suggested treatments for atherosclerosis, such as periodic injections of heparin, alcohol, antagonists to cholesterol absorption, and so on. Each treatment can be evaluated better if it is considered from the standpoint of whether it is aimed at prevention of the chronic disease or the acute episode. When this is done, it becomes apparent that none of these therapies is successful.

The only possible means of preventing atherosclerosis is in the treatment or prevention of diseases which are known to accelerate the process. Diabetes and hypothyroidism are the most common diseases associated with increased atherosclerosis. Some evidence suggests that hypertension per se may accelerate the atherosclerotic process, therefore, the treatment of hypertension also becomes an important step in preventive medicine. There is no definite way to prevent either the inception or progression of atherosclerosis. The only treatment available is the treatment of the acute episode.

Although this report has taken a rather negative approach to the treatment of atherosclerosis, it is done in an effort to clear the air. For too long, too many have talked as if atherosclerosis were understood. Much is known and there are many interesting leads, but much more research is needed to reach clear understanding and definite form of therapy.

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Symposium continued in June issue

Because of space limitations, it was found necessary to postpone three papers of the Hahnemann Symposium until the next issue of *Geriatrics*. These papers, which will appear in June as a continuation of the Symposium are:

"Antihypertensive Therapy for the Elderly Patient," by John R. Beem, M.D., and John H. Moyer, M.D.

"Aging and the Cutaneous System," by Carroll F. Burgoon, Jr., M.D., and Jane S. Burgoon, M.D.

"Common Digestive Problems in Older Patients," by Charles M. Thompson, M.D., and Joseph M. Gambescia, M.D.

Coronary heart disease

WILLIAM LIKOFF, M.D.
PHILADELPHIA

The clinical manifestations observed in 30 patients in whom an initial myocardial infarction developed at 70 years of age or later are reviewed. In the majority of cases, the infarction occurred in those patients who had preexisting clinical findings suggestive of coronary atherosclerosis and was accompanied by an exceptionally high morbidity and mortality rate.

◆ Coronary atherosclerosis and the resultant cardiac disorder occur predominantly after the age of 40. In men, the incidence probably reaches a peak at the age of 60, but in women it continues to rise until the age of 70. During the period of its usual occurrence, the clinical features of coronary heart disease generally are recognized with ease. They encompass a variety of manifestations alone or in combination, including pain, the paroxysmal or chronic forms of dyspnea, edema, various arrhythmias, conduction defects, and overt myocardial infarction.

In both sexes the incidence of coronary heart disease decreases during the eighth and ninth decades. Indeed, the frequency with which the coronary vessels are spared in very old people may be quite remarkable. With the incidence so sharply altered, the question arises whether, and to what extent, the actual clinical nature of the disease is different in the aged, and if recognition and treatment are thereby influenced.

For the purpose of this inquiry, experiences with 30 patients in whom an initial myocardial infarction developed at 70 years of age or later are reviewed.

Material

The 30 patients, 18 of whom were women, ranged in age from 70 to 75 years. Each had been under medical supervision for at least one year prior to, and two years following, the infarction. None offered a history or unequivocal evidence of a previous myocardial infarction. Diabetes mellitus was present but controlled in 4, or 10.3 per cent, of the patients. Two patients, or 6.6 per cent, had been treated successfully for carcinoma of the large bowel. One patient had chronic lymphogenous leukemia.

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Preinfarction Manifestations

PAIN

Prior to the acute myocardial infarction, 6, or 20 per cent, of the patients had angina pectoris. This symptom had many atypical features. Frequently it was a vague, insistent discomfort which was distributed over the entire precordium without being transmitted to either arm. It often occurred at rest or during sleep. As a general rule the onset and cessation of the pain were not clearly demarcated, so that its duration and the efficiency of nitroglycerine in providing relief remained obscure. Unusual tachycardia or severely disturbing paroxysms of abnormal heart rhythm were not reported as preceding or accompanying the attacks of acute, transient coronary insufficiency.

HEART FAILURE

Some manifestation of congestive heart

failure was recognized in 8, or 26.6 per cent, of the patients before the occurrence of the infarction. In the majority of instances the syndrome consisted of serious dyspnea with ordinary effort. Discrete attacks of acute paroxysmal dyspnea with pulmonary edema occurred in only one individual. Peripheral edema or hepatomegaly secondary to right ventricular failure also was observed in one patient.

ARRHYTHMIAS AND CONDUCTION DEFECTS

Arrhythmias and conduction defects were present in 21, or 70 per cent, of the patients. However, in 8 of these the abnormality consisted only of frequent and persistent premature ventricular systoles. Chronic atrial fibrillation was present in 6 patients, first degree heart block in 3, and major delays in intraventricular conduction time in 4.

BLOOD PRESSURE

The systolic blood pressure levels averaged 162 mm. Hg and ranged from 108 to 186 mm. Hg. The diastolic levels averaged 92 mm. Hg, with a maximum of 106 mm. Hg.

AUSCULTATORY ABNORMALITIES

The predominant auscultatory abnormality heard in 23, or 76.6 per cent, of the patients consisted of a systolic murmur, grade 2 or more in intensity. Over a third of these were heard at the base of the heart and the remainder at the apex.

HEART SIZE

Roentgenographic examination of the heart revealed at least a grade 1 enlargement of the left ventricle in each patient. A slightly greater increase in size was observed in 6, or 20 per cent, but there was no single example of massive cardiac enlargement.

ELECTROCARDIOGRAPHIC CHANGES

Abnormalities were observed in 25, or 83.3 per cent, of the patients. In addition to the arrhythmias and conduction delays previously noted, the changes consisted mainly of repolarization wave defects which were highly suggestive of myocardial abnormality.

Manifestations at Time of Infarction

PAIN

An acute exacerbation of pain or its occurrence for the first time heralded the onset of the infarction in 20, or 66.6 per cent, of the patients. Acute paroxysmal dyspnea and pulmonary edema marked the turn of events in 3, or 10 per cent. The remaining 7, or 23.3 per cent, had ill defined types of discomfort including marked fatigue and weakness.

HEART FAILURE

Acute left ventricular failure and the peripheral findings of shock occurred in 4, or 13.3 per cent, of the patients. Congestive heart failure in the form of pulmonary edema, rales, hepatomegaly, or peripheral edema developed after the infarction in an additional 10, or 33.3 per cent, of the individuals observed.

ARRHYTHMIAS AND CONDUCTION DEFECTS

Transient heart block occurred in 2, or 6.6 per cent, of the patients. A major intraventricular conduction defect appeared and persisted in 1, or 3.3 per cent. Normal sinus rhythm was replaced permanently by atrial fibrillation in another individual.

AUSCULTATORY ABNORMALITIES

Gallop rhythm was the most common auscultatory abnormality. It was noted in 9, or 30 per cent, of those studied. Each of these patients had one or more manifestations of heart failure. A pericardial friction rub was heard in only one individual included in this series.

THROMBOEMBOLIC EPISODES

These manifestations developed in 3, or 10 per cent, of the patients. The pul-

monary structures were involved in each instance.

ELECTROCARDIOGRAPHIC ABNORMALITIES

The findings of an acute transmural anterior or posterior myocardial infarction were observed in 24, or 80 per cent. The remaining 6 patients had acute subendocardial or incomplete myocardial involvement.

Mortality

Nine, or 30 per cent, of the patients died during the acute attack. An additional 8 succumbed during the follow-up period of two years. The total mortality for that period, therefore, was 56.6 per cent.

Discussion

This study indicates that a myocardial infarction seldom occurs for the first time in a patient who is 70 years or older unless there has been significant prior evidence of coronary heart disease. Discounting the nonspecific roentgenographic evidence of minimal left ventricular enlargement, discrete indications of a preexisting cardiac disorder were demonstrable in all but 2 of the 30 patients reported.

This contrasts with the recorded experiences in younger individuals. In the majority of patients under 40, myocardial infarction occurs without antecedent clinical manifestations. Indeed, sudden death may be the initial indication of unusual coronary atherosclerosis. Similarly, in many persons between 40 and 60 an infarction can develop quite unexpectedly.

Although clinical manifestations of coronary atherosclerosis generally are present in the aged persons who are seriously afflicted with the condition, positive objective findings are more common and dependable than historical or subjective data. For example, only 1 of 5 patients in this study had angina pectoris immediately before the infarction as opposed to the 4 of every 5 patients who had an abnormal electrocardiogram. Furthermore, the atypical features of the angina pectoris in many instances reduced the importance of the syndrome as a diagnostic aid. This also is in contrast with events in younger patients in whom subjective complaints frequently antedate, and almost invariably complement, objective abnormalities.

Many factors combine to weaken or obscure the significance of the symptomatic pattern in the aged. The loss of acuity in perception and interpretation is partially responsible. Physical limitations are also involved. It is most difficult for a patient to report whether pain is related to effort if exercise is limited by muscular infirmity. Finally, associated conditions also may be responsible. The cause of dyspnea, for example, may be interpreted only with the greatest difficulty in the presence of senile emphysema, coronary heart disease, and the general disability of the aged.

Three facts point up the seriousness of an infarction in the aged. The immediate mortality in the group observed in this study compares poorly with experiences among younger patients suffering their first infarction in whom a rate as low as 8 per cent may be expected.[1] Furthermore, 1 of every 2 patients experienced severe heart failure at the time of the infarction or during a reasonable period thereafter. Finally, approximately 40 per cent of those who recovered failed to survive two years.

As noted, the majority of the patients in this series had significant preexisting coronary atherosclerosis. Purportedly the collateral coronary bed increases in response to the degree of this vascular impairment. However, from the mortality and morbidity statistics reported, the collateral coronary circulation was not adequate enough to counterbalance the impact of an acute myocardial infarction. Furthermore, it did not prevent an unusually high percentage of transmural

involvement. Of course, it is not reasonable to suggest on this basis that preexisting coronary atherosclerosis does not augment the growth of a collateral coronary circulation. However, it is more logical to suspect that the rigors and deteriorations of age, when combined with an acute disease process, often undermine what under more ordinary physiologic circumstances would have been a satisfactory compensatory mechanism.

As a final observation, it is pertinent to acknowledge that the two-year survival rate in this group, however modest, serves as encouragement for those who suffer a myocardial infarction at 70 years of age or later. It is problematical whether this reflects current advances in therapy, including anticoagulation and early ambulation.

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DANGERS OF BILIARY ENTERIC FISTULA should be more widely understood. The majority of patients with this condition are elderly. It is usually a complication of longstanding and far-advanced biliary tract disease. While the fistula may cause serious damage to the liver, biliary tract, and other organs, diagnosis is commonly delayed until operation or autopsy. Infection often results, and complications may be fatal.

A cholecystogram showing air in the biliary tree is significant, and barium radiography or intravenous cholangiography with tomography may demonstrate lesions.

Antibiotics should be given before operation. Most successful is cholecystectomy, with exploration and drainage of the common duct and enteric repair, but procedures vary with conditions. In poor-risk cases, the first stage may consist only of decompression of a blocked common duct or removal of an obstructive stone from the terminal ileum.

F. GLENN and H. MANNIX, JR.: Biliary enteric fistula. Surg., Gynec. & Obst. 105: 693-705, 1957.

RENAL TUBULAR FUNCTION IN OLD AGE decreases more rapidly than the glomerular filtration capacity as determined by the increased ratio of inulin to penicillin elimination. This observation suggested that additional factors are involved in the rate of excretion of the antibiotic or that blood flow through the kidneys is reduced. In 20 subjects aged 20 to 86 years, the clearance of inulin was decreased from 130 to 20 and the clearance of benzyl penicillin from 500 to 100.

E. ORNSHOLT MATHIESEN and C. TROLLE-LASSEN: Renal elimination of penicillin by the aged. Scandinav. J. Clin. & Lab. Invest. 9: 213-217, 1957.

The surgical treatment of mitral and aortic stenosis in patients over 55

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Performance of mitral or aortic commissurotomy when patients are over 55 years of age represents a serious therapeutic venture. The added risks involved probably are derived from the various degenerative processes which mature with time. Under the circumstances, extreme care is mandatory in the selection of candidates for these procedures.

◆ Although rheumatic valvulitis has its inception in childhood or early adolescence, the resultant abnormal physiology usually develops gradually over a period of years. Consequently, the serious manifestations of most lesions generally are not apparent before the third decade. Thereafter, they mature to major proportions before the patient attains 50 years of age. Because of this basic devolutionary pattern, the surgical treatment of rheumatic heart disease is required and applied mainly in individuals who are between 30 and 50 years of age.

There are occasions when the detrimental effects of distorted and dysfunctioning valves develop more deliberately or are tolerated over a longer interval. Under these circumstances, the question of surgery may not arise until a patient has passed well into the sixth decade.

The past ten years have witnessed remarkable progress in the surgical treatment of rheumatic heart disease. Nevertheless, the question remains whether this therapeutic approach is accompanied by a reasonable promise of success when patients are in the older age groups or whether it is marked by prohibitive experiences in mortality and morbidity.

In an effort to clarify this point, the present report examines the immediate and long-range results attained in patients over 55 years of age who were subjected to mitral and aortic commissurotomy alone or in combination. The accomplishments of such procedures are compared with those already recorded in younger individuals.[1]

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Material

From June 1948 until July 1957, 1,561 patients were operated on for mitral stenosis. Of these, 45 were 55 years of age or older.

From April 1952 until July 1957, 396 patients had surgery for aortic stenosis. Of these, 30 were 55 years of age or older.

Combined mitral and aortic commissurotomies were performed on 122 patients during this same period. Five of these patients were 55 years of age or older.

Results

Results of the operative procedures are summarized under their respective headings.

MITRAL COMMISSUROTOMY

In the 45 patients under consideration, 36 of whom were women, the ages ranged

from 55 to 61 years. At the time of surgery, 6, or 13.3 per cent, died. Cardiac arrest or ventricular fibrillation accounted for each death.

The follow-up review was limited to 32 of the 39 survivors, who were observed from six months to five years. During this period, there were 6, or 18.8 per cent, deaths. Congestive heart failure was responsible in two instances, while a massive pulmonary embolism was the cause of death in one patient. One died of lung carcinoma and the remaining two of unknown causes.

Distinct clinical improvement was reported by 19, or 73 per cent, of the 26 survivors. No change was noted by 6, or 22.1 per cent, and 1, or 3.8 per cent, was classified as worse.

AORTIC COMMISSUROTOMY

The ages ranged from 55 to 67 years in the 30 patients included in this group. Each was operated on by a closed heart technic, using the transaortic or the transventricular portal to the aortic valve. Only 6 of these patients were women.

At the time of surgery or during the period of hospitalization immediately following, 14, or 46.6 per cent, died. These deaths were the result of cardiac arrest, ventricular fibrillation, or congestive failure secondary to the production of aortic insufficiency.

The 16 surviving patients were followed from one to three and one-half years. In this group, there were 5, or 31.2 per cent, late deaths. Four patients died of heart failure. In one instance, this was precipitated by subacute bacterial endocarditis resulting from Streptococcus viridans. One patient succumbed suddenly after thoracentesis.

Among the remaining 11 patients, 4, or 36.3 per cent, were considerably improved; 4, or 36.3 per cent, were unchanged; and 3, or 27.3 per cent, were worse.

COMBINED MITRAL AND AORTIC COMMISSUROTOMY

The 5 patients in this group, only 1 of whom was a woman, ranged in age from 55 to 59 years. One patient died at surgery and another during the two-year period of postoperative observation. Each of the remaining patients was improved.

Discussion

In this study, the risk of mitral or aortic commissurotomy in patients over 55 years of age was approximately twice that endured by younger individuals. It is, of course, possible that more advanced types of rheumatic heart disease rather than issues specifically related to age alone account for these results. Many of the details, such as valve areas and pressure gradients, which would permit a more definitive answer are lacking. However, the historical data and the objective manifestations in the older age group do not imply that the anatomic defects and functional incapacities were unusually severe. From the evidence on hand, it appears entirely reasonable to state that age itself exercised the determining influence on the mortality rate.

A similar view is warranted in regard to morbidity and the long-range response to operation. Approximately 1 of 3 patients failed to survive aortic commissurotomy more than three and one-half years. In many instances, however, the late deaths after aortic and mitral stenosis surgery were caused by new degenerative or neoplastic disease. Prolonged survival in the elderly patient, therefore, obviously is under the double jeopardy of continuing cardiac disease or newly acquired ailments.

The specific detrimental influence exercised by age depends upon the extent to which various degenerative processes mature. Among the more significant, from a cardiac viewpoint, are coronary atherosclerosis and involutionary myocardial degeneration.

It is apparent that even the earliest interference with coronary blood flow may have a profound influence on the recovery rate. This is particularly true because of the detrimental, if not lethal, role played by certain ventricular arrhythmias which presumably are initiated by hypoxia.

Involutionary myocardial changes are believed to arise as the result of specific biochemical defaults which develop with age. These may be related to the metabolism of proteins and vitamins. Regardless, the resultant muscular dysfunction may serve to initiate arrhythmias and also may contribute to the uneconomical energy-work ratio which develops in the heart.

The acknowledgment of a serious increase in the mortality rate of surgery for mitral or aortic stenosis when the patient is beyond 55 years of age is not a condemnation of these procedures in the elderly patient. To do so would be to deny therapy when it could prove beneficial. The devolutionary pattern of aortic stenosis, for example, very often does not mature prior to the sixth decade. From an age standpoint, therefore, the question of operation may not arise until quite late. However, many of these patients represent very acceptable surgical risks even at that time.

Because of the added risks involved, the older patient represents a particular problem in selection and preparation for mitral or aortic commissurotomy. Serious metabolic and vascular disorders which may accompany the rheumatic valve lesions are marked deterrents to surgical interference. Patients who represent extreme clinical expressions of mitral or aortic stenosis should not be submitted to operation. This includes those with massive cardiac enlargement and patients who remain in overt congestive heart failure despite adequate therapy. Conversely, patients who have survived beyond the age of 55 with lesions which are responsible for only minimal pathophysiology should not undergo surgery. It is quite likely that the individuals in this group will never be seriously incapacitated.

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SEBACEOUS CYSTS IN OLDER PERSONS previously afflicted with cancer should be promptly and widely excised. The lesions are not precancerous, but all surgically removed specimens should be examined microscopically to differentiate benign and malignant sebaceous and epidermoid cysts. The incidence of malignancy was 4.7 per cent in 239 patients.

J. W. WELCH: Carcinoma arising in sebaceous cysts. Arch. Surg. 76: 128-132, 1958.

Certain cardiac problems in the aged

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There is no established proof that senile heart disease is a clinical entity, but the existing evidence is described and evaluated. Certain selected problems associated with the aged heart are emphasized, including disturbances of cardiac rhythm, thyrotoxicosis, and bacterial endocarditis.

◆ Cardiac problems in the aged fall naturally into three basic categories—normalcy, organic disease of limited clinical significance, and organic disease which is potentially lethal. Senile heart disease, a relatively rare lesion, at least in the United States, warrants special discussion, as do the increasing frequency and incidence of arrhythmias and bacterial endocarditis. Psychogenic cardiac problems and heart disease in the psychotic senile will be considered at another time.

Classification of Cardiac Problems

NORMAL

This concept is at least as broad for the aged heart as it is for hearts of individuals in all other age groups. Empirically, age 70 may be considered the line of demarcation for discussion of the aged heart.

It is questionable whether arteriosclerotic aging at this period can be considered normal. There have been nonagenarians whose cardiac structures showed no such changes, and there have been detailed pathologic studies indicating that advanced degrees of arteriosclerosis may exist quite early in ininfancy. With such data available, it is apparent that arteriosclerosis cannot be considered as a normal aging process.

Semantics, the science of word meanings, illumines the centuries-old, fine distinction between physiologic and pathologic aging. Patients in the former category are "aged;" those in the latter are "senile."

Electrocardiographically, it is interesting to note the absence or presence of findings which would implicate or discount the existence of arteriosclerotic disease in the heart (figure I). Bundle-branch patterns, which do not produce symptoms or signs, are not uncommon in this age group. That bundle-branch block in the aged is evidence of arteriosclerotic coronary disease is almost incontestible, for other etiologic factors are rare among the aged, and nonsclerotic factors, such as congenital lesions or infiltrative processes, would preclude the person's having attained such an advanced age. It would seem, therefore, that only slight deviations from the normal configurations of any element of the electrocardiogram of an aged patient can be accepted as normal. Ballistocardiographically, comparable assertions seem plausible.

DISEASE OF LIMITED SIGNIFICANCE

Although certain cardiac lesions in the aged are of organic origin, their clinical

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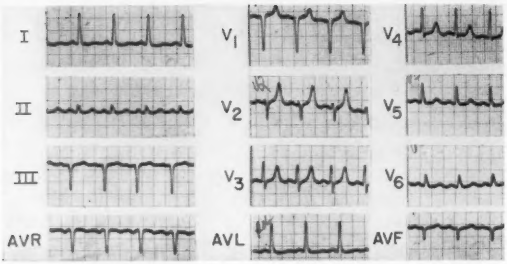


FIG. 1. *Normal variant tracing from 95-year-old white female with no history, symptoms, or evidence of cardiovascular disease. The tall, peaked T waves in leads V_2 and V_3 remained unchanged on serial study, as did all component parts of the electrocardiogram.*

significance must have been circumscribed for their possessor to have attained advanced age. Murmurs of auscultatory importance only, slight degrees of impaired impulse transmission, or disturbance of heart rhythm tolerated functionally are several examples of real evidence of heart disease whose presence constitutes little threat to the well-being of the aged patient.

POTENTIALLY LETHAL HEART DISEASE

Included in the area of heart lesions inimical to maintenance of well-being of the aged patient are all malfunctions problematic to the general adult patient, plus such conditions as cardiac changes, associated cardiovascular pathology, and the burdens imposed on the heart by deteriorative metabolic or other internal or external fatal environmental sequences (figure II).

Senile Heart Disease

Since there exists such a range of possibilities between the extremes of normal in younger hearts, it will be readily understood that the term, senile heart, is difficult to define. Granules of pigment appear in myofibrils, and the ratio becomes smaller as the heart reaches imperfection as a pumping organ. This evolutionary process is recognizable at autopsy as a normal sequence. Replacement of myofibrils by fibrous connective tissue not infrequently occurs to the extent that absolute ventricular myocardial mass is reduced substantially. Possibly because of poor nutritional habits, actual adipose tissue deposits in the myocardium overextend the epicardial fat depots and can replace extensively the right atrial tissue near the annulus. Subendocardial sites also seem to favor conglomeration of fat tissue. Whether these processes are inherently related to normal tissue senility or are developmental components of atherosclerosis is questionable. Cytochemical changes of major degree must be involved to allow such gross alterations to occur.

In 1945, Dock used the term, "presbycardia," to indicate nondemonstrable changes of the myocardium resulting in senescent imperfection of cardiac function, even to the extent of accounting for objective heart failure. Five years later, Harrison and Resnick urged that a definite distinction between heart disease in the elderly, with or without congestive failure, be made from arteriosclerotic heart disease. Senile heart disease was the terminology preferred by them.

Arrhythmias

There is an increased incidence of all types of arrhythmias in the senile heart, particularly paroxysmal atrial flutter and fibrillation. The basic concept of initial and prompt control of the ventricular rate in all ectopic rhythms associated with tachycardia is particularly pertinent in the aged because of the real danger of myocardial and cerebral ischemia, shock, embolization, and heart failure. Digitalis is the drug of choice for this purpose in dealing with the supraventricular tachycardias, while quinidine and Pronestyl should be employed for control of ventricular tachycardia. Atrial fibrillation with a normal ventricular rate is occasionally encountered in the elderly patient and does not constitute an indication for digitalis therapy unless there is associated congestive heart failure.

The decision regarding the advisability of conversion to sinus rhythm in cases of atrial flutter and fibrillation is dependent on the circumstances of the individual patient. In general, many patients in this older age group do well with adequate control of the ventricular rate with a maintenance dose of a digitalis preparation, unless some specific indication for attempted conversion to sinus rhythm arises, such as intractable heart failure or repeated embolization.

Bacterial Endocarditis

This condition is being encountered with increasing frequency in the elderly patient because of the extended life expectancy in recent years. Streptococcus viridans endocarditis was encountered several years ago in a 90-year-old male patient with chronic rheumatic valvular disease. Apparent clinical cure followed modest doses of penicillin over a period of ten days, as the patient refused further treatment. It is important to maintain a high index of suspicion in view of the insidious clinical picture this disease may present in the aged, due to the modified response to infection and the frequency of associated disease. The presence of unexplained fever and a cardiac murmur, no matter how insignificant it may appear, should alert the clinician to the possibility of bacterial endocarditis.

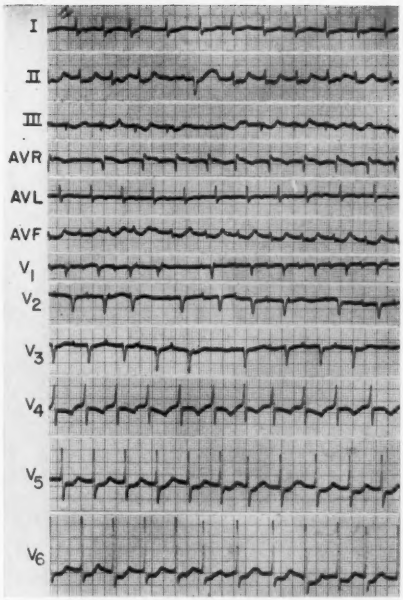


FIG. 11. *This abnormal electrocardiogram was taken upon a 96-year-old white female being evaluated for tolerance of contemplated major abdominal surgery. Despite varying degrees of A-V conduction, including second-degree heart block, functional capacity was unimpaired. Surgery was well tolerated.*

Every effort should be made to identify the causative organism by repeated blood cultures prior to institution of therapy, even in the acutely ill patient. A program of penicillin in large dosage with streptomycin may be initiated after an adequate number of blood cultures has been obtained and the program modified, if necessary, after the bacteriologic data are available.

Heart Failure in the Aged

The basic features of congestive heart failure are the same in all patients but certain clinical patterns are more frequently encountered in the aged.

A persistent cough may be the initial symptom of left ventricular failure precipitated by a respiratory infection in an elderly patient with cardiac involvement. Nocturnal cough on the basis of pulmonary vascular congestion is another highly suggestive feature. Insomnia due to mild air hunger or unrecognized nocturnal paroxysmal dyspnea may indicate onset of heart failure. Such information is not usually volunteered by the patient and may be elicited only by specific questioning.

Digestive disturbances, often vague in nature, may reflect underlying visceral, particularly hepatic, congestion on a cardiac basis. Abnormal fatigue, particularly in conjunction with one or more of the above symptoms, may direct attention to the possibility of cardiac embarrassment as the background for the clinical picture presented.

Factors Precipitating Heart Failure

Perhaps a sustained, progressive, deteriorative process characteristic solely of aging is the precipitating factor of heart failure in aged persons. Again, the extreme difficulty in distinguishing this from arteriosclerotic degenerative changes is pointed out.

Indirect clinical combinations suggest basic underlying cardiac abnormalities:

- Heart failure after age 50 is much more common than before age 30, regardless of the apparent or assumed etiology.

- Heart failure and atrial fibrillation are frequently found to be associated in the older thyrotoxic patient, while the same clinical problem is nonexistent in the second decade.

- Minimal degrees of arterial hypertension often appear to be the only etiologic factor in the elderly cardiac patient.

- Disturbances of impulse formation, transmission, and actuation, which many times are innocuous in the preadrenopause stage, are too frequently major items of distress in the postadrenopausal individual. What biochemical changes occur in the elderly to make them prone to ectopic impulse origin associated with relative refractoriness or hyperirritability is unknown. Little or no significant work has been done in the area of investigation of cardiac integrity and its relation to adrenal function. Resilience, reversibility from fatigue to freshness, stamina, and stability certainly are properties of the youthful body which are manifestly diminished in the aged.

- There is unquestionably a distinct difference in the manner of myocardial response to certain drugs between the pediatric and geriatric heart.

- Electrolyte disturbances can alter cardiac function in any age group, but it is our impression that the elderly tolerate less readily small deviations of this nature than do younger patients. This may in part derive from the fact that excretory functions of the skin and kidney tend to be suboptimal in the aged, but the cardiac reaction to such clinical complications still seems to be relatively exaggerated.

Lack of knowledge in this area of cardiovascular study is peculiarly striking, since the United States has continued to experience an increase in the number of persons achieving senior status. The field for basic research is practically virgin.

Our own emphasis must be upon the bio- and cytochemical aspects. Possibly continued studies of the mode of digitalis metabolism will lead most directly to intelligible answers. So simple an answer as direct reduction in functional myocardial mass could be most impor-

tant in explaining the riddle of heart failure in the aged.

PHYSICAL OR EMOTIONAL STRESS

Nonsclerotogenic aging of the myocardium may be analogous to the state of the insufficient kidney. That is, such a heart is compensated and maintains bodily functions satisfactorily, so long as no stress is incurred. With stress, decompensation, dysrhythmias, cardiac disability, and even death are imminent. Stress upon the heart may be aggravated by emotional or psychic circumstances, as in the case of the anginal syndrome. This would appear to be a cytochemical phenomenon resulting from the tremendous speed of reaction. Its critical relationship to an intact heart needs no amplification here, but its rarity in the aged and senile heart suggests that these hearts are different in some undemonstrated manner. If we are to comprehend either aging itself as a normal process, or arteriosclerosis as a pathologic process, it is erroneous to assume that the tissue of old hearts must also be old. In relation to medium-sized peripheral arterial vessels, it was once thought that osseous lesions always occurred in previously existing atherosclerotic plaques, but it was later shown that no arteriosclerotic changes need be present for there to be readily recognizable bony changes in arterial walls.

If the precept that replacement of previous functional myofibrils by noncontractile tissue is valid, then it follows that the infinitely reduced remaining atrioventricular mass can never function quite as effectively as the original unaltered cardiac organ. Acceptance of this hypothesis leads to the subsequent proposition that the aged heart will no longer be able to sustain the organism in its customary state of well-being. Even slight increments of physical work will increase too greatly the load the heart can bear.

Emotional stress can play a secondary part in precipitating heart failure in the aged. We have mentioned that the anginal syndrome seems to occur less frequently in the advanced aged group, but emotional stress appears, upon occasion, to be the only demonstrable variation in routine living which might account for the emergence of an inadequate pumping organ from a heart capable to responding to all demands. Judgment is reserved, however, because it is unlikely that so easy an explanation can be made for heart failure in the aged.

INFECTION

Indisputably, acute infectious processes provide an environment in which an aged heart can decompensate without apology. Actual myocarditis may be the main inciting pathophysiologic state, but even the basic accentuations inherent in infectious febrile states may well be burden enough to overexert the heart in the aged. Simple tachycardia may induce actual heart failure, as may the more severe problems attendant with dysrhythmias or arrhythmias generated in ectopic pacemakers because of localized alterations or myocardial irritability.

ASSOCIATED ORGANIC DISEASE

Another real problem is the fact that congestive heart failure may be obscured by the presence of associated disease. This situation is especially apt to occur in the elderly patient. The presence of chronic lung disease may confuse the situation and great difficulty may be encountered in an attempt to determine whether the pulmonary symptoms and signs are caused by the lung involvement per se, cardiac failure, or a combination of both factors.

Rheumatic disease. This may stand out predominantly as an associated problem in the aged cardiovascular system, especially since it enhances arteriosclerotic lesions. No special implications oc-

cur as a result of its having appeared as a complicating problem in this advanced age group.

Syphilis. Despite the fact that cardiovascular syphilis is a tertiary lesion and probably one developing over several decades, it has been seen recently as a rare cardiac problem in the aged.

Nutritional disturbances. Fickle eating habits often dictate the older person's diet. One has to contend with edentulous, sedentary, and constipated individuals whose whims of diet are as unpredictable as those of the pregnant female. It is a small wonder that nutritional disturbances, obesity, and vitamin deficiencies contribute to the problem of providing a constant metabolic milieu for the elderly patient.

Anemia. This condition, most often iron-deficiency or metabolic, may pose an additional work load for the aged heart. The myocardium itself quite possibly is undernourished. Alteration of the inherent properties of heart muscle is a distinct possibility under these circumstances, with resultant gross organ malfunction to the extent of rhythmic disturbances, congestive heart failure, or coronary arterial insufficiency.

Myocardosis. This noninflammatory alteration of myocardial integrity may be caused by azotemia. In the aged, it may frequently be caused by obstructive uropathy. Hazards of contending with unusual types of myocardial irritability ensue, along with the potentiality of congestive heart failure. Extreme care in the prescription of cardiac drugs must be exercised under these conditions. Use of potassium and other similar substances must be respectful.

Thyrotoxicosis or masked hyperthyroidism. This is not an uncommon lesion in the elderly. Otherwise unexplained rapid heart rates, paroxsmal rapid rhythms, sudden onset of sustained arrhythmias, and seemingly unexplainable congestive heart failure may be due to the thyrotoxic state. Aged persons commonly do not manifest other gross evidence of thyroid disease, thus making the etiology of the cardiac lesions somewhat more obscure. No single laboratory method can be relied upon for discrete diagnosis.

Metastatic malignancy. Exotic lesions need not be sought to complicate the problems of the heart in the aged, but it is helpful to remember that this organ is not immune to the invasion of metastatic cancer, particularly from contiguous primary lesions (figures IV, V, and VI). But margarid nodules from genitourinary cancer are about as frequent as those secondary to bronchogenic carcinoma. The interference with normal functioning of the heart depends upon the location and extent of the implanted lesion.

Digitalis Therapy

This drug occupies an important place in the treatment of cardiac disorders in the elderly patient but certain principles of administration deserve special consideration. The choice of preparation will depend to a great extent on the individual physician's familiarity and experience with available digitalis products. Although there is sound basis for the use of rapidly excreted preparations in the aged, with the thought that the duration of unpleasant symptoms will be lessened should the drug be given to the point of toxicity, the longer-acting preparations, such as digitoxin, may be employed with safety and satisfaction, provided careful administration and clinical judgment are observed. In all age groups and particularly in the elderly, the use of digitalis is an individual experiment. Generally speaking, slow digitalization by the oral route is the method of choice.

INDICATIONS

There are certain clinical situations where the drug is sometimes unjustifiably

FIG. III. *Gross specimen of heart of an aged patient, showing myocardial fibrosis not associated with atherosclerotic coronary artery disease.*

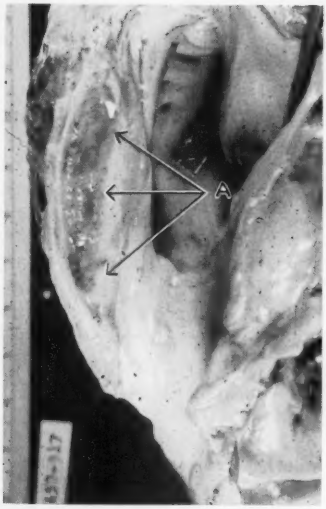
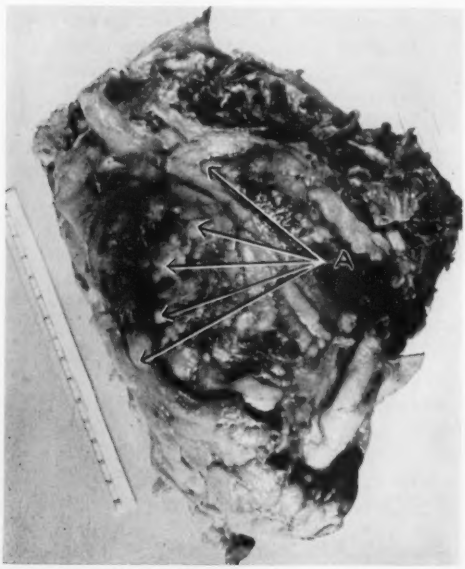


FIG. IV. *Infiltration of myocardium of patient who died of bronchogenic carcinoma.*

FIG. VI. *Margaric nodule of pericardium, representing secondary implant from bronchogenic carcinoma.*

Figures III, IV, V, and VI courtesy of Karl E. Kowai, M.D.

FIG. V. *Multiple nodularity of myocardium, due to metastatic carcinoma.*



withheld for fear of untoward effect. The presence of partial A-V heart block does not constitute a contraindication to the use of digitalis because experience has shown that the drug may be used under this circumstance in an average therapeutic dosage without increasing the degree of block. In the presence of complete A-V block, digitalis may also be used for its specific muscular effect in the treatment of congestive heart failure. Premature systoles noted prior to digitalis therapy are no contraindication to the use of the drug. These ectopic contractions are frequently abolished during the course of digitalization. If a definite indication exists, there is no reason to withhold this drug in the presence of anginal syndrome. There has been considerable trepidation in the past concerning the use of digitalis in the presence of acute myocardial infarction, but clinical experience in recent years has indicated that most of the objections raised to such usage have been more theoretic than real. Increasing evidence supports this impression that the drug may be employed in average therapeutic dosage when indicated for the treatment of heart failure associated with myocardial infarction without fear of severe untoward effect.

TOXICITY

The toxic effects of digitalis as observed in the aged deserve special emphasis because of certain unusual features.

- Toxic effects may precede or accompany therapeutic effects and are dependent upon a number of factors—the amount of the drug used, the degree of myocardial disease, and the presence of altered electrolyte balance, particularly potassium depletion which may transform a tolerated dose into a toxic one. As has been frequently stated, it is most important to realize that, in the aged, this range of therapeutic effect is narrowed and the chance of toxic effect is enhanced.

- There is some evidence to indicate that the more unusual symptoms of digitalis toxicity, such as mental depression, agitation, weakness, and, particularly, visual disturbances, are more frequent in the aged than in younger groups.

- Cardiac manifestations of toxicity, such as premature systoles and ectopic rhythms, occur more frequently in the elderly patient. These findings may precede the usual symptoms of anorexia, nausea, and vomiting and may preclude the administration of a sufficient amount of the drug to produce a therapeutic effect. Careful and frequent examination of the older patient receiving any digitalis product is essential in order to observe these cardiac disturbances and prevent a more serious degree of intoxication.

- Digitalis toxicity may be one factor contributing to intractable heart failure. Evaluation of this possibility is indicated in any case when the response to therapy appears unsatisfactory or inadequate.

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Auscultation of the heart in the aged

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There are no specific or diagnostic auscultatory findings of the heart in the aged. Heart sounds, murmurs, and abnormal rhythms are discussed, with emphasis on the importance or relative insignificance of certain findings in the evaluation of the senile heart by auscultation. Radiography, electrocardiography, and functional appraisal are more reliable and valuable technics in the study of the aging heart.

◆ There are no characteristic or diagtic auscultatory findings which can be attributed solely to the normal aging process of the heart. The senile heart, in the absence of rheumatic valvular disease, congenital abnormalities, or other damage, undergoes certain biochemical and physiologic changes which may be more important than structural or anatomic alterations. These may be so subtle that they are appreciated only when this heart is subjected to unusual stress, metabolic disturbance, or infection, which may actually result in myocardial failure. Thus, hypertension, mild thyrotoxicosis, and paroxysmal tachycardias may have no direct effect on the young heart but can produce congestive failure in elderly subjects.

The following discussion will review some of the abnormal auscultatory findings of the heart in elderly patients. Emphasis will be placed on the importance of certain findings and also point out those which can be considered as normal variations for the aged. Heart sounds, murmurs, and disturbances of rhythm will be discussed in that order.

Heart Sounds

Changes in the bony and muscular components of the chest wall, obesity, and pulmonary pathology alter heart sounds, changing their pitch and intensity. For example, the first heart sound at the apex may be diminished in intensity because of pulmonary emphysema which many times may be the result of kyphoscoliosis. If, however, this faint mitral first sound is associated with a prominent apical thrust, it may have real significance and represent left ventricular failure from any cause. On the other hand, accentuation of the mitral first sound is a much less common finding in senile hearts, but it should be borne in mind that it may be heard in the presence of thyrotoxicosis. Reduplication of the mitral first sound usually is of no particular significance. Although it is easy to infer that this is the result of asynchronous closure of the A-V valves, caused by failure on the part of both ventricles to contract simultaneously, this is most often not so. Even though bundle-branch block is associated with this phenomenon, it is heard in so many more individuals who do not have bundle-branch block that it would be a great error to correlate one with the other.

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This is a good example of unwarranted a priori reasoning which is rather too common, not only in cardiac auscultation but in the broader field of cardiology; usually it results from lack of broad experience in the autopsy room.

Reduplication or split heart sounds should be readily identified by the fact that both components are heard very close to each other and are identical in pitch, quality, intensity, and duration. The opening snap of a mitral stenosis produces a third heart sound in diastole, which is best heard at the apex; this is evidence of mild-degree mitral stenosis, a common finding in rheumatic heart disease in youth, but almost never encountered in the older group. A physiologic third heart sound is much less commonly heard in the aged heart and again is most commonly found in childhood and youth. A systolic click—a short, sharp, third sound occurring in late systole and usually heard along the lower left sternal border—has no clinical significance and is not associated with any known pathologic change.

At the base of the heart in the pulmonic area, the second sound may be louder than normal, the result of increased pressure in the pulmonic circuit which has persisted for some time. However, reduplication of this pulmonic second sound of itself is of no particular significance. In the aortic areas, the second right and third left interspaces, there may be significant changes in the second sound. Since the aorta usually develops the greatest changes as a result of the aging process, with more or less sclerotic change superimposed, alterations of the second sound, often associated with murmurs, occur in these areas. Stiffening of the walls of the aorta, calcification of the medial coat with aortic valve sclerosis, and dilatation of the aorta and aortic valve ring—all are associated with auscultatory findings.

More commonly than is generally recognized, aortic valve stenosis, on the basis of some degree of early rheumatic infection with superimposed sclerotic damage, may present a serious problem. Patients with this condition frequently have anginal distress and failure rarely develops except as a terminal event. At autopsy it is often surprising to see to what extent this valve may be stenosed and calcified, and it is difficult at times to reconcile very advanced changes with the functional capacity that existed before death. The characteristic auscultatory finding in these patients is a diminished or absent aortic second sound associated with a rough aortic systolic murmur. If these is some degree of associated aortic insufficiency, an early diastolic murmur will also be heard. It should be emphasized that this murmur is rough in character, not blowing as is usual in hypertension, and that the second sound is never accentuated as it is in hypertension. An accentuated aortic second sound is a very common finding and, if slight and not associated with any other abnormal finding, it may be considered a normal variant in this age group. However, if it is much accentuated, it is usually associated with hypertension in the systemic circuit, and, if it actually has a ringing character, it may represent a serious degree of longstanding hypertension or a syphilitic aortitis.

Murmurs

Murmurs at the apex are commonly heard in the aged and usually are of little significance. However, in longstanding left ventricular failure from coronary artery disease with or without systemic hypertension, there may be dilatation of the left ventricle with enlargement of the mitral ring, producing a relative mitral insufficiency. This usually causes a blowing systolic murmur which, it must be emphasized, is much less important than other findings, such as radiologic evidence of left ventricular enlargement.

This is in contrast to the younger age group, in which these murmurs may represent congenital or rheumatic damage.

In auscultation of the heart for murmurs, it may help to put the patient in left lateral recumbent position in order to bring out murmurs at the apex, just as having the patient sit up and lean forward often increases the intensity of murmurs at the base. Sufficient exercise to increase the heart rate somewhat will often bring out a murmur, but it is not to be considered a method of differentiating an innocent murmur from one resulting from structural damage. Diastolic murmurs caused by mitral stenosis are rarely heard in the aged but, at times, the transmitted early diastolic murmurs of aortic insufficiency may well be heard in this area. At the base, murmurs in the pulmonic area are usually the result of transmission and not of pulmonary valve damage. As noted previously, the most important murmur in the aortic area is characteristically rough, is associated with diminution of the second sound, and is the result of aortic valve stenosis. Hypertensive heart disease is very often associated with a systolic murmur, usually blowing but sometimes rough, and with an accentuated aortic second sound. The characteristic murmur of aortic insufficiency is one in early diastole, replacing or coming immediately after the second sound. This is not a usual finding in the aged, but occasionally it may be heard as the result of slight aortic insufficiency, not necessarily of dynamic significance.

Disturbances of Rhythm

Gallop rhythm and rarely heard tic-tac rhythm are both of serious import and require absolute rest on the part of the patient. Gallop rhythm can be recognized by a triple sequence of sounds at a rate of 100 or more per minute, associated with a lilt. True gallop, diastolic in time, really sounds like the gallop of a horse and cannot be produced at a rate less than 100 per minute. It is very important to differentiate this from other three-sound cycles, such as the systolic click and opening snap, which were mentioned previously.

Sinus arrythmia, premature systoles, and auricular fibrillation are the most common cardiac arrythmias in the aged. Auricular fibrillation occurs rather frequently after the age of 50 and, although most cases are not the result of a masked thyrotoxicosis, this should always be suspected and investigated. Most abnormal rhythms can be recognized by auscultation, but the wise physician always depends on an electrocardiogram to confirm his opinion. The rhythms which can usually be differentiated by auscultation are auricular fibrillation, auricular flutter, and paroxysmal ventricular tachycardia. Gross irregularity identifies auricular fibrillation in most cases. If the rate is low, sufficient exercise to increase it to 100 or 110 per minute will usually increase irregularity; this is in contrast to the heart with many premature systoles which are usually diminished by exercise.

Regular rapid cardiac rates of 300 per minute or multiples of it, such as 150 per minute, may be recognized as auricular flutter if the jugular pulse is compared to the apical rate. This venous pulse, representing auricular contraction, will be two, three, or four times faster than the apical rate. If carotid pressure is applied, the apical rate will be reduced suddenly by multiples of four, three, or two and return promptly to its original rate on release of this pressure. Ventricular tachycardias at rates of 160 to 200 per minute produce a slightly irregular rhythm with slight variations in the intensity of the sounds at the apex, the result of variation in diastolic filling of the ventricles. In any case, an electrocardiogram should be taken for positive identification of this

disturbance, because of its seriousness and need for subsequent careful management.

Premature systoles arising from either the auricles or the ventricles are usually of little significance, for they may be the result of excessive smoking, nervous tension, unusual alcoholic imbibition, or of some unknown cause. However, frequent premature systoles, especially of ventricular origin and particularly if they are doubled or arise from multiple foci, warrant further investigation. These are often serious and not infrequently are the precursors of a paroxysmal ventricular tachycardia. Coupling is frequently the result of digitalis intoxication, but, in the absence of this medication, it is usually due to myocardial disease associated with coronary artery atherosclerosis. This latter condition may also produce single premature ventricular systoles. Frequent auricular premature systoles may be an early sign of masked thyrotoxicosis which can progress to auricular fibrillation and congestive failure in the senile heart.

The presence of premature systoles in an elderly patient following an acute coronary thrombosis with myocardial infarction warrants careful observation. These may precede the onset of paroxysmal ventricular tachycardia or auricular fibrillation and may result in sudden death, acute pulmonary edema, or congestive heart failure, unless prompt therapy is instituted to control them. Control can usually be accomplished by the judicious use of quinidine sulfate or Pronestyl. A similar situation may result in elderly patients after any type of surgery, if a serious degree of myocardial hypoxia is caused by anesthesia or is secondary to surgical trauma.

In the aged patient undergoing surgery, it is important to assess the character and quality of heart sounds and murmurs before operation, or, in the patient with a febrile illness such as pneumonia or acute cholecystitis, it is important to assess them early. Changes in rhythm, heart sounds, or murmurs may be the first clue to impending cardiac failure and proper therapy may then be instituted more quickly. Morbidity and mortality rates in geriatric patients undergoing surgery or suffering from serious febrile illnesses can be greatly reduced by such careful observation. A generation ago it was common practice to appraise the strength or weakness of a heart by noting whether the sounds at the apex were of normal intensity or whether they were "weak." Fortunately, this has gone out of vogue and more intelligent means are now used.

Conclusions

The common auscultatory findings in the heart of the aged, with various alterations in heart sounds, murmurs, and disturbances of cardiac rhythm have been presented. There is definite need for better understanding and appreciation of cardiac auscultatory findings, and experience with postgraduate groups fully justifies the opinion that the art of auscultation might be better practiced by most physicians. Tape recordings of all common abnormal auscultatory findings may be secured for self-instruction from the American Heart Association, and phonograph records for this purpose are commercially available.

The cerebral circulation and metabolism of the aging

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Aging is associated with a decrease in cerebral blood flow and oxygen consumption and an increase in cerebrovascular resistance. These changes are more pronounced in individuals with clinical cerebrovascular disease. The correlation between cerebral blood flow or oxygen consumption and mental status is poor. The inhalation of 5 per cent carbon dioxide is the most potent means of producing selective cerebral vasodilatation, but the usefulness of this procedure has not been extensively studied.

◆ A little more than a decade has passed since the present phase of study of the human cerebral circulation was launched by Kety and Schmidt's development of a practical method for the measurement of the cerebral blood flow.[1] This procedure has now been applied to the study of individuals of every age from childhood[2] to the tenth decade.[3] It is the intent of this paper to review present knowledge of cerebral circulatory physiology as related to "normal aging" and the influence of arteriosclerosis and hypertension, and to consider briefly the pharmacologic effects of various agents upon the cerebral circulation of elderly people.

The details of the nitrous oxide technic for the measurement of the cerebral blood flow have been described elsewhere.[1] The method enables the determination of cerebral blood flow in terms of cubic centimeters per one hundred grams of brain tissue. Total cerebral blood flow may be estimated by multiplying this figure by an average brain weight. Only areas of brain actually perfused contribute to the final figure for blood flow calculated by the nitrous oxide method. A totally ischemic area is not represented in the final result; this limitation has particular importance in relation to the studies concerned with cerebrovascular disease.

Reference to cerebral metabolism as studied by the nitrous oxide method pertains almost exclusively to oxygen utilization. The cerebral consumption of glucose has also been studied but not so extensively that conclusions germane to the present discussion may be drawn. Cerebral oxygen utilization may be calculated as follows:

$CMRO_2$ (cerebral O_2 utilization in cc./min./100 gm.) = CBF (cerebral blood flow in cc./100 gm./min.) x (arterial — venous [internal jugular]) O_2 concentrations/100 cc.

This expression provides a useful index of total cerebral metabolic activity but furnishes no insight into the intermediary metabolism.

The third parameter of importance is

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the cerebrovascular resistance (CVR), which is calculated from the following relationship:

$$\text{CVR (mm. Hg/cc./100 gm./min.)} = \frac{\text{mean arterial blood pressure (MABP mm. Hg)}}{\text{CBF (cc./100 gm./min.)}}$$

Strictly speaking, jugular venous pressure should be subtracted from MABP in the above expression, but most authors neglect this correction. When the viscosity of the blood is constant, CVR is dependent upon the degree of vascular tone and the presence of organic occlusive changes within the cerebral vessels. In the acute situation, a decrease in CVR is interpreted as indicating cerebrovascular dilatation, and an increase in CVR is thought to be due to cerebral vasoconstriction. In many situations, however, it is not clear whether the vasodilatation or vasoconstriction is mediated by nervous control or humoral agents or through the direct action of the pharmacologic agent upon the cerebral vessels.

Effects of Aging on Cerebral Blood Flow and Metabolism

Aging and an increasing incidence of arteriosclerosis are so intimately associated that one cannot with certainty separate the effects of one from the other. The best available compromise has been the employment of clinical criteria to exclude the presence of cerebrovascular disease. It is well appreciated by the various investigators that the use of such clinical yardsticks does not really achieve a satisfactory delineation of a group that is wholly free of arteriosclerosis. Because of this fact, much of what is said about "normal aging" should be viewed with some caution.

Accepted normals for the various parameters of cerebral circulatory function at age 20 are as follows: CBF, 60 cc./100 gm./min.; $CMRO_2$, 3.7 cc./100 gm./min.; CVR, 1.5 mm. Hg/cc./100 gm./min.[4] Thus, blood flow to the brain accounts for approximately 15 per cent of the cardiac output and 20 per cent of total basal oxygen consumption. The most striking changes in CBF and metabolism actually occur between infancy and 20 years of age, but this period of life is associated with the growth and development phase rather than the period of senescence with which this discussion is concerned. By 90 years of age, the CBF falls to 39 cc./100 gm./min.; the $CMRO_2$ declines to 2.3 cc./100 gm./min.; and the CVR rises to 2.7 mm. Hg/cc./100 gm./min.[3]

Sufficient information is available to formulate an over-all picture of the changes in these cerebral circulatory functions between the age extremes of 20 and 90. Figures I through III have been adapted from the publications of Kety,[5] Brandfronbrener and associates,[6] and Shock.[7] These graphs plot the percentage changes in the various parameters considered against age. The value for a given parameter at age 20 is the normal or 100 per cent value in each instance.

In figure I, the fall in CBF with age is compared to the decline in the cardiac index with age. These graphs should not be accepted too literally but considered as gross depictions of trends. In any event, it seems clear that the decline in CBF is paralleled by a similar change in the cardiac index. This relationship serves to emphasize that the reduction in CBF with aging is not unique. Blood flow to other areas must be similarly reduced. A similar pattern is evidenced in figure II wherein the fall in $CMRO_2$ with aging is compared to the fall in the basal metabolic rate. Again, the decline is similar and suggests that the proportion of oxygen consumed by the brain in relation to total basal oxygen consumption remains relatively constant. It may also be concluded that the fraction of the cardiac output received by the

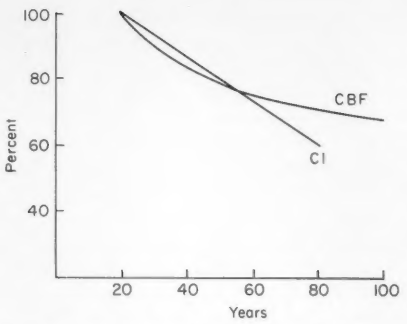

FIG. I. *Comparison of changes in cerebral blood flow (CBF) and cardiac index (CI) with aging.*[5,6]

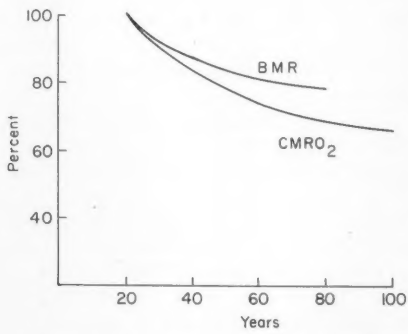

FIG. II. *Comparison of changes in cerebral utilization of oxygen ($CMRO_2$) and basal metabolic rate with aging.*[5,7]

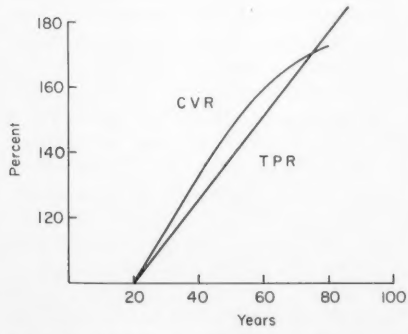

FIG. III. *Comparison of changes in cerebral vascular resistance (CVR) and total peripheral resistance (TPR) with aging.*[5,6]

brain also remains relatively stable through the years. It will require a direct study of these parameters in the same individuals to verify the validity of these inferences. In figure III, the increasing CVR with age parallels a similar increase in total peripheral resistance.

These curves will probably be subjected to some revision in coming years. At the present time, they are based on relatively small samples of the population. Further revision will also be necessary as our ability to exclude the individual with subclinical arteriosclerosis improves. Indeed, a most interesting finding in the studies to date has been the wide range of values for CBF and $CMRO_2$ found at all age levels. It would be of interest to investigate more thoroughly those individuals with a high CBF and $CMRO_2$ for a given age. The question arising in these cases is whether other measurements of physiologic functions will prove to be above "normal" for the particular age.

This descriptive account of the changes occurring in the cerebral circulation with aging represents the current viewpoint and is supported by the available data.[5] In proceeding to a discussion of the significance of these observations, we enter an area of abundant speculation supported only by inference rather than by definitive observation and experimentation. The heart of the problem revolves around the ever-troublesome question of what is cause and what is effect.

It may be argued that the decrease in $CMRO_2$ is the primary event and that the reduction in the blood supply follows the decreased metabolic needs of the brain. In support of this argument is the fact that, in the acute situation, the brain does not respond to a drop in blood flow by decreasing the $CMRO_2$ but increases its extraction of oxygen from the available blood.[8] On the other hand, nothing is known of the effects of slowly progressive decrements in the cerebral blood

supply. The possibility that a chronic state of ischemia leads to a reduction in $CMRO_2$ by some adaptative mechanism has not been excluded. A final, but less likely, possibility is that the parallel reduction in CBF and $CMRO_2$ is fortuitous, and the two are not really related in a cause-effect relationship at all. It is perhaps easier to accept the increasing CVR as a manifestation of increasing arteriosclerosis, but even here one may ascend the "which comes first" merry-go-round. It is perhaps better to recognize the need for further investigation in this area than to continue with these polemics.

Effects of Hypertension and Arteriosclerosis on Cerebral Circulation

The association of arteriosclerosis in particular and hypertension to a lesser degree is so closely allied to the aging process that a separation of the effects of the two upon the cerebral circulation is to an extent arbitrary and artificial. Carrying out investigations related to arteriosclerosis is beset with some inherent difficulties. Foremost among these are the very detection and quantification of cerebral arteriosclerosis. A history of cerebral thrombosis or mental deterioration on a vascular basis is commonly used as the chief criterion for classifying a patient as having cerebrovascular disease. These clinical events at best provide a poor measure of the extent of such vascular disease and undoubtedly allow for the inclusion of patients with considerable vascular disease in the "normal" group. In addition, methodologic limitations of the nitrous oxide technic, which have already been touched upon, must also be kept in mind. Thus, the values for CBF and $CMRO_2$ may be misleadingly high if there are areas of wholly unperfused brain. In spite of these difficulties, sufficient data have been accumulated to permit some generalizations.

The results of studies of elderly normotensive individuals with and without clinically evident cerebrovascular disease are summarized in table 1. These data clearly indicate that individuals with a history of cerebral thrombosis have a lower CBF and higher CVR than their counterparts without such a history. The $CMRO_2$ of the group experiencing the vascular accidents is not, however, appreciably lower. The CBF of the patients with psychoses, and, thus, presumably more diffuse cerebrovascular involvement, is no lower than that of the patients with focal cerebrovascular involvement. The $CMRO_2$ in the group of mentally affected is lower than the normal for the same age but does not differ greatly from that noted for the patients with a history of old cerebrovascular accidents.

Table 2 summarizes the observations of various investigators concerned with cerebral circulatory functions of patients with essential hypertension without clinical evidence of accompanying arteriosclerosis. In this area, results have been uniformly consistent.[9-11] Except for an increase in the CVR, the CBF and $CMRO_2$ are normal, that is, comparable to that of other individuals of the same age.

Table 3 presents a summary of data drawn from the literature to define the combined effect of hypertension and arteriosclerosis upon cerebral hemodynamics and metabolism. In these patients with hypertensive arteriosclerotic cardiovascular disease (HASCVD), the CBF is depressed to the same low level, about 40 cc./100 gm./min. in all categories listed. There appears to be little difference in the CBF at the various age levels. The CBF is not different in those with a history of a cerebrovascular accident or even in the presence of psychoses. Apart from the presence of an increased CVR, the results for CBF and $CMRO_2$ are very similar to the results noted for the elderly normotensive patients with a history

TABLE 1

CEREBRAL BLOOD FLOW AND METABOLISM OF ELDERLY NORMOTENSIVES

Classification	*No.*	*Age*	*CBF (cc./100 gm./min.)*	*$CMRO_2$ (cc./100 gm./min.)*	*CVR (mm. Hg/cc./100 gm./min.)*	*MABP (mm. Hg)*
No cerebrovascular disease[9]	13	80	48	2.7	2.1	94
No cerebrovascular disease, but arteriosclerosis elsewhere[10]	19	69	44	2.5	2.2	96
Old or recent CVA[9]	13	73	38	2.5	2.7	97
Senile psychoses[9]	13	83	38	2.2	2.6	94

TABLE 2

CEREBRAL BLOOD FLOW AND METABOLISM IN ESSENTIAL HYPERTENSION

Classification	*No.*	*Age*	*CBF (cc./100 gm./min.)*	*$CMRO_2$ (cc./100 gm./min.)*	*CVR (mm. Hg/cc./100 gm./min.)*	*MABP (mm. Hg)*
Young hypertensives[10]	6	44	52	3.1	2.6	136
Young hypertensives[9]	8	42	57	3.4	2.7	152
Elderly hypertensives[9]	17	68	49	2.8	3.2	150

TABLE 3

CEREBRAL BLOOD FLOW AND METABOLISM IN HYPERTENSIVE ARTERIOSCLEROTIC CARDIOVASCULAR DISEASE

Classification	*No.*	*Age*	*CBF (cc./100 gm./min.)*	*$CMRO_2$ (cc./100 gm./min.)*	*CVR (mm. Hg/cc./100 gm./min.)*	*MABP (mm. Hg)*
Young hypertensives with CVA[9]	15	44	42	2.5	3.4	138
Elderly HASCVD without CVA[10]	7	61	39	2.4	3.4	139
Elderly HASCVD with cerebrovascular disease[10]	7	51	37	2.6	3.7	131
Elderly HASCVD with CVA[9]	51	65	41	2.3	3.6	137
Elderly HASCVD with psychoses[9]	14	75	42	2.4	3.8	148

of a cerebrovascular accident (table 1). As suggested by Fazekas and associates,[9] the primary effect of hypertension appears to be to accelerate the occurrence of arteriosclerosis. Arteriosclerosis accompanied by hypertension does not cause a greater decline in CBF or $CMRO_2$ than arteriosclerosis per se, but the changes occur at much younger age levels.

Many studies concerned with vascular disease of the brain have attempted to determine if there is a difference in CBF or $CMRO_2$ between patients with cerebrovascular disease who demonstrate mental symptoms and those who do not. The results of studies made by Fazekas and associates[9,12,13] and Shenkin, and co-workers,[10] as shown in table 1 and 3, fail to reveal a good correlation between mental status and cerebral circulatory function. These results compare well to the reports of Freyhan and associates[14] and Heyman and associates,[15] whose data lead to similar conclusions. On the other hand, divergent results have been reported by Scheinberg[16] and Linden,[17] both of whom found that CBF and $CMRO_2$ were lower when mental symptoms were present. At the present time, it is difficult to resolve these discrepancies, although we are inclined to accept the views of Fazekas, who has had the most extensive experience in this field.

Pharmacologic Aspects of the Aging Cerebral Circulation

It is beyond the scope of this paper to attempt a review of the entire literature concerned with the pharmacodynamics of the cerebral circulation. An attempt will be made, however, to select for review those studies which have a direct bearing on the treatment of the elderly patient with cerebrovascular disease.

At the present time, the inhalation of 5 to 7 per cent CO_2 remains the most potent and possibly the only means of *selectively* causing cerebral vasodilatation and increasing the CBF.[18-20] The effects of CO_2 inhalation are so potent that its use has been suggested as a means of differentiating between organic occlusion and functional vasospasm.[19] Table 4 presents the results of various investigations concerned with the effects of this procedure. The changes in CVR are of the greatest importance, since the changes in CBF also reflect the slightly hypertensive effect of CO_2 inhalation. A 30 per cent reduction in CVR was obtained in both the normal group and the patients with essential hypertension. The results dealing with elderly arteriosclerotic normotensive patients are less consistent, a mere 10 per cent reduction in CVR being noted in the group reported by Novack and associates[19] and a 24 per cent reduction reported in the group of Fazekas and co-workers.[20] The reductions in CVR noted with the hypertensive arteriosclerotic group are 21 and 11 per cent, respectively, for the two groups recorded. The important fact indicated by these studies is that an appreciable amount of vascular tone persists even in the presence of organic involvement of the cerebral vessels. Furthermore, this cerebral tone may be relaxed by the inhalation of CO_2. There thus seems to be a clear potentiality of obtaining an increase in the CBF of patients with cerebrovascular disease.

Having stated that there is perhaps a rational basis for our attempts to increase the CBF in patients with cerebral thrombosis, it must also be admitted that there are no studies available which definitely establish the efficacy of such measures. To cite only several of the unknown factors: we do not know how long the cerebral vasodilatation mediated by inhalation of CO_2 can be maintained; we do not know what the possible ill effects of prolonged CO_2 administration to elderly subjects with vascular disease may be; and we cannot even be sure that successful maintenance of an increased CBF by any means will result in ultimate

TABLE 4

EFFECTS OF CARBON DIOXIDE INHALATION (5 PER CENT) ON CEREBRAL BLOOD FLOW AND METABOLISM

Classification	*No.*	*Age*	*CBF (cc./100 gm./min.)*		*$CMRO_2$ (cc./100 gm./min.)*		*CVR (mm. Hg/cc./100 gm./min.)*		*MABP (mm. Hg)*	
			C	*E*	*C*	*E*	*C*	*E*	*C*	*E*
Young normotensive[19]	12	30	53	74	3.4	3.4	1.8	1.2	103	126
Elderly normotensive with ASCVD[19]	10	64	47	55	3.1	2.7	2.1	1.9	94	98
Elderly normotensive with CVA[20]	14	74	35	56	2.0	2.2	2.9	2.2	95	115
Hypertensive-arteriosclerotic (6 with CVA)[19]	10	55	36	49	2.6	2.7	3.7	3.0	132	139
Hypertensive-arteriosclerotic with CVA[20]	18	69	39	47	2.1	2.2	3.6	3.2	132	143
Essential hypertension[19]	6	52	52	86	3.1	3.6	2.6	1.7	136	150

clinical improvement of these patients. Unfortunately, the effects of other agents used in an effort to obtain selective cerebral vasodilatation may be dismissed as being inconsequential when compared to the effects of CO_2. A definitive study with CO_2 seems sorely needed.

Although the various hypotensive drugs are not specifically used for the treatment of cerebrovascular accidents, except perhaps in the case of hypertensive encephalopathy, they deserve consideration because of their potentially adverse effects upon the cerebral circulation. In general, the response of the cerebral circulation to a drop in blood pressure seems fairly consistent and independent of the etiology of that drop. The studies of Moyer and Morris[8] are indicative of the results to be expected. As the blood pressure is reduced, the CVR is reduced proportionately, tending to maintain the CBF. At some point, maximal cerebral vasodilatation is reached, and a drop in CBF accompanies any further reduction in blood pressure. As the cerebral blood flow falls, the $CMRO_2$ is maintained by an increased extraction of oxygen from the available blood.

As indicated by the studies with CO_2 (table 4), the degree of cerebral vasodilatation obtained in patients with arteriosclerotic or hypertensive arteriosclerotic cerebrovascular disease is not as great as in the normal or uncomplicated cases of essential hypertension. It would thus be anticipated that such patients would be more prone to suffer cerebrovascular insufficiency if treated too vigorously with hypotensive drugs. This is borne out in clinical experience and in the clinical experiments carried out by Bessman and associates.[21] Symptoms of cerebral ischemia were encountered in 80 per cent of the 10 elderly patients who became hypotensive when treated with tetraethylammonium chloride. This occurred despite the fact that the reduction in CBF was not great. These authors postulated that the drop in perfusion pressure affects the areas involved by arteriosclerosis more severely. Of all the hypotensive agents, only Apresoline[22] seems capable of actually increasing the

CBF. This effect would appear to be secondary to the increase in cardiac output produced by this agent. Kleh and Fazekas found it particularly useful in the therapy of the hypertensive arteriosclerotic patient with cerebrovascular disease.[22]

Theophylline with ethylenediamine (aminophylline) is unique in its ability to cause cerebral vasoconstriction with a consequent increase in CVR and decrease in CBF.[23] This drug has the ability to reduce the blood flow even in the presence of cerebral arteriosclerosis.[20] This effect would seem to interdict the use of this drug in the presence of cerebrovascular disease. However, these theoretic objections must be weighed against the practical value of aminophylline in treating Cheyne-Stokes respiration,[24] cardiac failure,[24] and headaches resulting from hypertension.[25]

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Management of cerebrovascular accidents in elderly patients

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The differential diagnosis of various cerebral vascular lesions is described. Therapeutically, it is more important to determine the type of lesion than its exact location. Fleeting, transient cerebral symptoms due to cerebral vascular insufficiency are discussed. Treatment of the acute stage of the various types of cerebral vascular accidents is presented. The importance of encouraging the patient to care for his personal needs early and to attempt ambulation as soon as his condition permits is emphasized. Management of the spasticity which usually occurs in patients who recover from a cerebral accident is mentioned.

◆ Cerebral vascular lesions are the most common cause of general or focal brain disturbances and are found in about 25 per cent of routine autopsies in a general hospital. They occur at any age, but intracerebral hemorrhage and encephalomalacia due to thrombosis of a cerebral artery are rare occurrences before the age of 40. The highest incidence of cerebral hemorrhage is in the fifth to eighth decades, whereas cerebral thrombosis occurs most often in the sixth to eighth decades.[1] The patient recovering from a cerebral vascular accident constitutes a major problem in chronic care and rehabilitation. Furthermore, the number of these stroke victims is increasing as more people are living to old age.

For generations, medical students have been taught that cerebral thrombosis, embolus, and hemorrhage are the cause of apoplexy. Within recent years, the concept of cerebral vascular insufficiency has been formulated.[2] The cerebral vessels are subject to many of the influences which affect blood vessels elsewhere in the body—for instance, vasoconstrictor and vasodilator nerve impulses, hormones, chemical products of metabolism, and drugs. One of the important peculiarities of the cerebral circulation is that its vessels can be strongly dilated by many influences and constricted weakly by only a few.

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Dilatation is effected by decreased oxygen or increased CO_2 concentrations, by increased acidity and temperature, acetylcholine, histamine, potassium and calcium ions, and nitrites.

Vasoconstriction occurs with increased oxygen and decreased CO_2 content, but otherwise the intracranial vessels are relatively insensitive to the agents that cause vasoconstriction in other parts of the body.[3]

Cerebral vascular insufficiency or hypotension in the cerebrovascular tree may be caused by hemorrhagic shock, antihypertensive drugs, anesthetics, the carotid sinus syndrome, sympathectomy, traumatic shock, cardiac surgery, cardiac arrhythmias, congestive heart failure, Stokes-Adams syndrome, myocardial in-

farction, and slow progressive occlusion of the carotid and basilar arteries.[4]

In the elderly patient, with the possible exception of those cases resulting from cerebral embolism, arteriosclerosis is the common cause of apoplexy. However, all patients with cerebrovascular accidents are not to be considered as being alike, either clinically or therapeutically. From the standpoint of treatment, it is more important to determine whether the lesion is a thrombosis, a hemorrhage, or an embolus than to know its exact location. Indeed, immediate treatment frequently influences the outcome of the case.

Diagnosis

Hemorrhage and occlusion of a cerebral vessel are frequently extremely difficult to differentiate at the bedside. Certain salient features in differential diagnosis should be kept in mind, not the least of which is the sequence of events preceding the stroke.

CEREBRAL THROMBOSIS

It is now generally conceded that, in practically all cases, cerebral thrombosis results from a lowering of the general circulatory efficiency in individuals with cerebral arteriosclerosis. Many cases have been reported in which severe shock or myocardial infarction due to coronary occlusion was followed almost immediately by cerebral thrombosis. Indeed, the symptoms of the "paralytic stroke" may overshadow those referable to the heart, and, as a result, the coronary occlusion may be unrecognized for some time. Cerebral thrombosis is more common than cerebral hemorrhage, occurring in the approximate ratio of 3 to 1. The acute symptoms of thrombosis may be caused by a single large thrombus or from small ones which tend to occur repeatedly and in various scattered areas of the brain.

Although the presence or absence of hypertension is not of great importance in differentiating between cerebral thrombosis and hemorrhage, in general, a thrombus tends to form while the patient is at rest or during sleep. If a large vessel such as the middle cerebral artery is occluded, the patient not infrequently awakens in the morning with weakness or paralysis of one side of the body. He is unaware of the paralysis and on attempting to arise may fall to the floor. As a general rule, loss of consciousness does not occur at the onset. In fact, it may not be lost at any time during the illness. Frequently, fleeting symptoms may occur for days or even weeks before the complete occlusion of the vessel develops in the nature of paresthesia of the face or extremities on one side of the body, transient weakness of a limb, or attacks of aphasia. These cases with premonitory symptoms afford good opportunity for preventive treatment. When a large vessel, such as the middle cerebral artery, becomes thrombosed, the clinical picture is that of hemiplegia with or without clouding of the sensorium. If the artery on the left side is involved, the patient has difficulty with speech because of aphasia.

The diagnosis depends largely on the history and evolution of symptoms. The usual case reveals a history of previous fleeting disabilities and then either a slow onset of paralysis or onset during sleep. If symptoms developed rapidly, a careful search for a source of embolus should be made.

CEREBRAL HEMORRHAGE

As noted previously, intracerebral hemorrhage occurs most often during the fifth to eighth decades. The most common cause is arteriosclerosis. Usually, the hemorrhage is preceded by stress of some sort, such as heavy lifting, straining at stool, or a severe coughing spell.

Any part of the cerebrum may be the site of hemorrhage, but the region of

the basal ganglia is most commonly affected. If the hemorrhage is small, it may become encapsulated, and, in time, a cystic cavity may form. A large hemorrhage may occupy practically all of one cerebral hemisphere. Rupture into the ventricular system may occur with an extensive hemorrhage, causing death in several hours. Sudden death from intracerebral hemorrhage, however, is extremely unlikely. In the usual case, the onset of the stroke is sudden. The patient may complain of intense headache followed in a matter of minutes by collapse and loss of consciousness. The face is flushed, breathing is stertorous, and the pulse is full and bounding. Occasionally, the patient is in shock with a weak rapid pulse. There is a rapid fall in blood pressure. The usual signs of a flaccid hemiplegia appear early. Bilateral Babinski signs are not uncommon soon after the onset because of the increased intracranial pressure. If intraventricular rupture occurs, coma deepens, and signs of meningeal irritation with nuchal rigidity and Kernig's signs develop rapidly. In such instances, spinal tap reveals grossly bloody spinal fluid under pronounced pressure. If the hemorrhage has not ruptured into the ventricles or the subarachnoid space, spinal tap may either be clear or show a slight amount of blood or a xanthochromic tinge in the spinal fluid.

CEREBRAL EMBOLISM

This type of cerebral vascular accident may occur in any age group, but the greatest incidence is in the fifth and sixth decades. In middle-aged or elderly people, embolism is frequently associated with coronary thrombosis or auricular fibrillation. Clots on the auricular walls become dislodged spontaneously or after return of normal rhythm or more forceful contraction of the heart as the result of treatment with digitalis, quinidine, and other drugs.

The symptoms are even more rapid in onset than those following intracerebral hemorrhage. For instance, if the patient is standing, he falls as though shot. If he is in bed at the time of the occlusion, loss of consciousness is just as sudden. In addition to a flaccid hemiplegia, there is usually clinical evidence of shock. The symptoms of embolism may simulate hemorrhage so closely that differentiation between the two is practically impossible. Convulsions may occur during the course of any cerebral vascular accident. However, they occur more frequently at the onset of embolism than with the other forms. Generalized seizures are more common than focal fits.

MULTIPLE VASCULAR LESIONS

Fleeting, transient cerebral symptoms are common in the older age group. These brief attacks may be characterized simply by vertigo, confusion, and memory disturbances. Repeated episodes of aphasia may occur. In other instances, weakness of an extremity or one side of the body may be experienced and last from a few minutes to a half hour or so.

The fundamental disturbance underlying these attacks is unknown, although some have attributed it to angiospasm. It seems more probable that the basic pathology is thrombosis of small arteries or arterioles previously narrowed by arteriosclerosis. In some cases, the transitory cerebral symptoms are caused by chronic thrombosis of the internal carotid artery or of the basilar artery. When either of these vessels is suddenly occluded, the result is usually a severe and rapidly fatal coma. More gradual stenosis, on the other hand, produces a state of episodic insufficiency in the circle of Willis, which is responsible for recurrent attacks of paralysis, aphasia, and so forth. It may be that abnormal vasoconstrictor impulses arise in the region of the carotid sinus, which not infrequently is the site of arteriosclerosis. When the tran-

sient disturbance is in the nature of numbness and weakness of one side of the body with or without dysphasia, slow occlusion of the contralateral internal carotid or middle cerebral artery is to be suspected. When the fleeting incidents comprise dizziness, blurred vision or actual blindness, extraocular muscle weakness, and paresthesia and weakness of the limbs, slow occlusion of the basilar artery must be suspected.[5]

The influence of the general systemic circulation in these little strokes should be emphasized. As noted before, occlusion of cerebral vessels by thrombosis commonly occurs during sleep and is not rare after surgery or during the vascular collapse of myocardial infarction. Any temporary disturbance of the general circulation with reduced volume output of the heart in the elderly arteriosclerotic patient may result in a state of local or general cerebral vascular insufficiency and symptoms of altered cerebral function.

In time, the classical signs of a major cerebral vascular accident develop in patients with a slow progressive thrombosis of a large cerebral artery. The repeated minor vascular accidents caused by occlusion of small vessels in both cerebral hemispheres eventuate in pseudobulbar palsy. The patient walks with a spastic gait and small shuffling steps and laughs and weeps on slight provocation. Dysphagia and dysarthria develop concomitantly. The deep tendon reflexes are all increased, and Babinski signs are present bilaterally.

Treatment

In the acute stage, efficient, skillful nursing care is essential. Fluids may be given by mouth if the patient is conscious and able to swallow. However, parenteral fluids by vein or hypodermoclysis are usually necessary during the first few days after the stroke. It is recommended that 2,500 to 3,000 cc. be given every twenty-four hours in the form of 5 per cent glucose, 1,000 cc. of which is given in physiologic saline solution and the remaining amount in distilled water. An ampule of vitamin B complex and vitamin C is added to the solution. Tube feedings should be started at the end of the first week if the patient is still unable to swallow. Two thousand calories and 0.5 to 1 gm. of protein per kilogram of body weight are daily requirements. The stomach tube should be replaced every forty-eight hours to avoid increased nasopharyngeal secretion and the possibility of esophagitis.

The bladder should be emptied by catheterization, if necessary, and cleansing enemas should be given every other day. Although there is the risk of infection, an indwelling catheter is usually necessary for a few days after a stroke. After the first two days, the indwelling catheter should be clamped off and released every two to four hours to prevent bladder contraction. If tidal drainage can be instituted, the risk of infection is reduced. However, if bladder infection does develop, the use of the sulfonamide Gantrisin (sulfisoxazole) is advocated because of its relatively low renal toxicity and because it can be given by mouth or stomach tube.

The patient's position in bed should be changed every three or four hours to prevent the development of decubitus ulcers and hypostatic pneumonia. An adequate airway is of great importance. Suctioning to remove oral and nasal secretions must be done frequently. As a general rule, the patient is more comfortable and safer on his side, because spontaneous coughing occurs with less effort and the aspiration of mucus or vomitus into the tracheobronchial tree is less likely to occur. Many patients require oxygen therapy. This is best administered by mask or oxygen tent rather than by nasal catheter. It is suggested that the rate of flow of oxygen be about

6 liters per minute by mask and 8 to 10 liters per minute in a tent in order to insure an oxygen concentration of 45 to 50 per cent. In cases of cerebral thrombosis and embolism, there may be some therapeutic value in adding 5 to 6 per cent CO_2 in order to produce cerebral vasodilatation.

Sedatives should be used carefully and the opium derivatives avoided because of a depressant effect on the respiratory centers.

Some clinicians advocate prophylactic use of penicillin and the other antibiotics to prevent intercurrent infection. There may be some virtue to the routine use of these drugs in the comatose patient. On the other hand, the routine use of antibiotics in patients who are not comatose is untenable. Weinstein[6] has reported a series of patients with respiratory infection who were not given routine antibiotics and who had a lower incidence of secondary infections than did those who were given routine chemoprophylaxis. He also noted that the organisms Pseudomonas pyocyanea, penicillin-resistant Staphylococcus aureus, and Hemophilus influenzae in the treated group were more difficult types to combat. The bacterial flora in the respiratory tract of patients with cerebrovascular accidents is usually mixed, and, therefore, combinations of penicillin and streptomycin or the tetracyclines should be used after an infection develops.

The increased intracranial pressure which occurs not infrequently with intracerebral hemorrhage may be reduced by spinal tap. In fact, this may be necessary as an early diagnostic procedure to aid in differentiating between hemorrhage and occlusion. The administration of 50 cc. of a 50 per cent glucose solutio by vein and 8 oz. of 25 per cent magnesium sulphate solution by rectum are also helpful in reducing increased intracranial pressure. Care should be taken to avoid excessive dehydration.

Craniotomy and the operative removal of the clot in patients who have survived the initial shock of a cerebral hemorrhage must be given careful consideration. In some cases, the operation may preserve life and limit the residual neurologic deficits. Unfortunately, the poor condition of the patient is a deterrent to the general use of this form of treatment. Suitable candidates for surgery are those who have survived the initial shock of the hemorrhage and in whom signs of increased intracranial pressure develop as evidenced by papilledema, increase in the degree of coma, and increased pressure on lumbar puncture. It should be noted that even in patients who are considered good operative risks, the mortality rate has ranged from 12 to 28 per cent.[7]

In cases of cerebral infarction caused by thrombosis or embolus, efforts are made to improve the cerebral circulation. Stellate ganglion block is advocated by some authors, but accumulated evidence for the most part shows that this procedure is ineffective, particularly in the arteriosclerotic age group.

Vasodilating drugs, such as histamine, nicotinic acid, Priscoline, and papaverine hydrochloride, may influence cerebral blood flow to a slight degree and merit consideration in the treatment of cerebral thrombosis and embolus. Papaverine hydrochloride has been found effective in doses varying from 4.5 to 18 gr. a day in cases of embolization. Brain[8] recommends the intravenous injection of 100 mg. of nicotinomide as early as possible in cases of cerebral embolus in the hope that the resulting vasodilatation may cause the embolus to move into a smaller artery.

In recent years, interest has been renewed in the use of the anticoagulant drugs in the treatment of cerebral infarction, particularly when due to cerebral embolism, and to prevent further embolization. Candidates for this type of

therapy should not be hypertensive and should have no evidence of blood in the spinal fluid, either grossly or microscopically, in order to obviate the possibility of cerebral hemorrhage.

It is recommended that 75 mg. of heparin in 50 cc. of normal saline solution be given intravenously during the first twenty-four hours and repeated every three to four hours as needed to keep the venous clotting time at approximately twenty minutes. Dicumarol is also started on the first day with an initial dose of 200 mg. Thereafter, daily prothrombin time estimations are done, and the dosage of Dicumarol is adjusted accordingly. In order to attain adequate anticoagulant effect, the prothrombin time should be maintained at approximately 25 per cent of normal. Dicumarol is also being used in the treatment of intermittent insufficiency of the basilar and internal carotid arteries in an attempt to prevent progressive thrombosis in these vessels. The technic of administering the drug is essentially the same as that described for cerebral infarction. There is still insufficient evidence to conclude whether this form of therapy has any significant effect on the natural history of the intermittent insufficiency or the occlusion syndrome. In addition to the risk of hemorrhagic complications, the use of the anticoagulants has some drawbacks in that frequent prothrombin time determinations and careful and close observation for comparatively long periods of time are necessary.

Cortisone has been used in the treatment of cerebral infarction. It has been postulated that the anti-inflammatory effect of the steroid retards the development of cerebral edema and limits the tissue response following occlusion of a cerebral artery. There are dangers in the administration of this drug, particularly in patients with malignant hypertension and diabetes. Russek and associates[9] reported that, in 27 patients out of 35, cortisone produced an improvement within a few days which ordinarily might have occurred within three weeks or so. These authors noted an improvement in the mental and emotional status and in the paralytic symptoms which was helpful in the management of the case. During the first two days, 300 mg. were given orally in divided doses and then 50 mg. a day for three weeks. Similar doses of parenteral cortisone were administered if the patient had difficulty in swallowing. In addition, a low salt diet and 3 gm. of potassium chloride per day were prescribed.

Although, because of inadequately controlled studies, there is insufficient evidence at this time to ascertain the value of the steroids, it seems that in selected cases these agents may be helpful. For instance, in cases of aphasia due to cerebral infarction, every effort should be made to retard edema in the cerebral tissues surrounding the infarct in order to preserve as much speech as possible. As a rule, the inability to communicate by speech has a more devastating effect on the personality of the patient than paralysis of the limbs.

As soon as the patient has recovered from the shock of the cerebral vascular accident, massage and passive movement of the paralyzed limbs should be instituted. This aids in maintaining proper circulation in the paralyzed muscles and helps to prevent contractures and painful fixations of joints, particularly at the shoulder and wrist.

It is essential that the patient be encouraged to perform for himself such activities as washing, dressing, and feeding as early as possible. The first voluntary movements should be aided by simultaneous passive movements of the joints.

At the end of the first week or ten days, many patients are able to be helped into a sitting position at the side of the bed. If there is no cardiac complication,

the patient may be allowed to stand momentarily by the tenth to fourteenth day. This is beneficial from a psychologic standpoint and hastens the return of postural sensibility.

Spasticity occurs in practically all hemiplegics and is the chief cause of flexion contractures in the upper extremity and extensor fixation in the lower limb. The foot is usually held in plantar flexion with resulting tightness and shortening of the heel cord. Sometimes this fixation is so pronounced that either stretching or surgical lengthening of the Achilles tendon is necessary.

Various drugs have been advocated in the treatment of spasticity, such as Myanesin, zoxazolamine (Flexin), and orphenadrine hydrochloride (Disipal), but, in most cases, the results have been disappointing. Occasionally, the spasticity may be relieved somewhat by combining one of these drugs with meprobamate (Miltown, Equanil).

No detailed description of the physical rehabilitation of the hemiplegic patient can be undertaken in this brief account. However, he should be encouraged to attempt to walk as soon as his general physical condition permits. He may be aided at first by leaning on an attendant's shoulder or on the back of a chair and pushing it before him. A cane should be used as soon as practicable and continued as an aid in walking until such time as the trunk and leg muscles are sufficiently strong to support him. Heat in the form of warm compresses or infrared rays, massage, passive and active exercises, and muscle training should be used daily for at least several months to insure a maximum return of function.

Many patients need some type of support for the paretic leg and foot. Usually, a short leg brace with foot drop attachment suffices.

The treatment of aphasia is tedious and prolonged and is best given by a trained speech therapist. Fortunately, however, in the majority of patients, the lesion is not centered in the speech areas, and complete or nearly complete return of speech may be expected.[10]

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Anemia in the elderly patient

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There are two important factors to be considered in the treatment of anemia in elderly patients. The first is the cause of the anemia, as most anemias are secondary to other disease. The second is correct diagnosis followed by specific therapy, since the so-called "shotgun" preparations are costly and often have little therapeutic value.

◆ The finding of anemia in the elderly patient usually signifies a more serious underlying disease. However, it should be considered that hemoglobin levels and the number of erythrocytes per cubic millimeter that are usually referred to as normal are those of young adults who are generally fairly active. For this reason, hemoglobin and erythrocyte levels in sedentary elderly individuals that by usual standards are considered "low normal" or even indicate a mild degree of anemia are not unusual and probably meet these older persons' requirements quite adequately. In investigating the cause of anemia in this age group, the importance of a detailed history and physical examination is paramount because anemia is often the first "symptom" of such conditions as chronic infection, gastrointestinal bleeding, malignancy, or malabsorption syndrome. Of course, the diagnosis of the type of anemia is entirely dependent on laboratory findings. The physician should be familiar with the quality of the work from the laboratory to which he refers his patients. This point is of particular importance, as the treatment of anemia calls for specific therapy, and, certainly, vitamin B_{12} would be of little value in an iron deficiency anemia. Much emphasis should be placed on the condemnation of the "shotgun" methods of therapy. These preparations are costly when compared to the specific medications and if, perchance, the diagnosis were in error and the patient with pernicious anemia received significant doses of folic acid, rather extensive neurologic damage could result and the patient be needlessly handicapped.

It is not the intent of this paper to discuss anemias in general or to classify them according to red cell morphology. Only the types of anemia that are most likely to be encountered will be included, and such types as the hemoglobinopathies, hereditary anemias, and rare anemias due to specific amino acids will not be considered.

Symptoms

In general, the symptoms attributable to anemia are quite protean in nature. Most commonly, patients complain of weakness, fatigability, and shortness of breath but not paroxysmal nocturnal dyspnea unless they are in cardiac failure. One of the striking features presented by these patients is the physiologic adjustment that they exhibit.[1] This occurs in patients in whom anemia develops gradually over a period of several months, and it is not unusual to see a patient with 5 gm. of hemoglobin per

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100 cc. of blood whose only symptoms are shortness of breath on exertion and a tendency to tire easily. Occasionally, elderly patients with severe anemias just decrease their activities until they do little more than move from bed to chair with no complaints other than that they don't feel like doing anything. In spite of the fact that one is not supposed to be able to survive with less than 5 gm. of hemoglobin per 100 cc. of blood, it is not unusual for the physician to see patients with levels of less than 3.0 gm. per 100 cc. of blood or with 4 to 6 gm. per 100 cc. Again, it should be remembered that this is a slow, prolonged reduction in the amount of circulating hemoglobin. Other suggestive symptoms are intermittent claudication, palpitation, increased sensitivity to cold, and tinnitus or roaring in the ears. Some patients have been known to go into frank cardiac failure on the basis of anemia which is a high output failure. They exhibit the classic signs of pulmonary edema, pedal edema, and tachycardia but have a rapid rather than prolonged circulation time.[1] Of course, there are other symptoms and findings, but many of these occur with a specific type of anemia and will be discussed later.

ANEMIA ASSOCIATED WITH MALIGNANCY

The anemia associated with malignancy[2] is certainly one of the most important types, and the finding of a normocytic and normochromic anemia in a patient who appears to be otherwise healthy should involve a rather thorough search for a possible neoplasm. Of course, when bleeding is due to a neoplasm, the anemia is microcytic and hypochromic. This condition will be discussed later in the paper. The anemia associated with malignancy is usually myelophthisic, and quite frequently malignant cells can be demonstrated in bone marrow aspirates. Occasionally, immature cells of the myeloid series and nucleated red cells are found in the peripheral blood. This picture is most commonly seen with malignancies of the breast, adrenals, lung, thyroid, and prostate, since these are tumors that often metastasize to bone. However, the so-called crowding may not and probably does not comprise the entire picture, and there may be multiple etiologic factors, such as decreased red cell life span[3, 4] and decreased adrenocortical activity.

This type of anemia is also associated with other hematologic disorders, such as multiple myeloma and various leukemias. The anemia in multiple myeloma is primarily on a myelophthisic basis. However, there is a very significant degree of hemolysis in most of the leukemias and, more particularly, in chronic lymphatic leukemia. The treatment of this type of anemia depends upon the treatment of the malignancy, which is usually fairly widespread before the anemia appears. However, in the leukemic states, there is a good possibility of correcting the anemia by treatment with chemotherapeutic agents which act against the primary process.[5] Also, when the degree of hemolysis is significant, such as is seen in chronic lymphatic leukemia, corticosteroids may prove quite beneficial and even completely control the anemia.[6]

PERNICIOUS ANEMIA

Pernicious anemia is essentially a disease of older people. It is unusual before 40 years of age and occurs with increasing frequency through the 70's. It is seen in both sexes with approximately equal frequency. This type of anemia is rare in the colored race and is more or less unusual in Orientals and Jewish people.[3] The patient with pernicious anemia often has a sallow-lemon complexion, premature gray hair, blue eyes, and long ears. Symptoms associated with the development of the disease are frequently a sore mouth and indigestion as well as the more protean complaint of excessive

fatigue. The physician is often surprised to find how much lower the total red cell count and hemoglobin levels are than he imagined. Certainly, among the most important aspects of pernicious anemia are the neurologic manifestations. Complaints that are referrable to the neurologic changes are often an inability to walk at night (loss of a sense of position) and numbness and tingling of the extremities. Also, there may be sphincter disturbances and drowsiness. Even though it was originally thought that the changes were limited to the spinal cord, it is now well accepted that peripheral nerve involvement also occurs.[3] There is frequently pronounced disparity between the degree of anemia and the neurologic involvement. Even though the anemia and neurologic involvement are present in the great majority of cases, a rather severe anemia with few, if any, neurologic findings is not unusual, whereas another patient may have only a moderately severe anemia but such severe neurologic manifestations that he is unable to walk. In rare instances, patients may have neurologic disease but no anemia.

Another important aspect is the incidence of carcinoma of the stomach in this group of patients, which is approximately 3 times that of the average population. This fact should be kept in mind, and barium visualization of the upper gastrointestinal tract or cytologic studies of some type should probably be done at approximately six-month intervals.

The more important and rather classic physical findings are the lemon-yellow color and, possibly, vitiligo. The smooth, red tongue is usually but not always seen. The liver and spleen are occasionally enlarged when the patient is in relapse even though the latter is usually not palpable. They regress with adequate therapy. The other pertinent physical findings are referrable to the nervous system. The most important is the loss of vibratory sensation, which is usually limited to the lower extremities. Also, there is commonly a loss of sense of position, and the Rhomberg will be positive. Hypotonicity of the muscles and diminished or absent reflexes are also frequently seen. The anemia is macrocytic and normochromic in type. It is often wise to look at a stained film of peripheral blood as well as to calculate the indices which would indicate a definite increase in red cell size. The remarkable features to be noted in the peripheral blood film are the macrocytic cells, some of which will be polychromatophilic, and marked basophilic stippling might be seen in some of the cells. Also, some small but very misshapen cells will be present and included with these will be the so-called "tailed cells" or "frying pan" cells as well as occasional nucleated red cells. There may also be a slight to pronounced thrombocytopenia and usually a neutropenia. Many of the neutrophils will be of the large multilobed type, and 8-lobed cells are not uncommon. Examination of bone marrow aspirate will reveal the typical megaloblastic marrow with a maturation defect in the erythroid series. Abnormalities may also be noted in the myeloid and megakaryocytic series. Gastric analysis reveals the complete absence of free hydrochloric acid, which is often associated with achylia gastrica.

The vitamin B_{12}, labeled with radioactive cobalt, test is a definite aid in the diagnosis of pernicious anemia, since it is positive whether the patient is in relapse or remission. The test depends upon the amount of radioactive cobalt that is excreted after an oral dose. The patient with pernicious anemia excretes about 2 per cent or less in twenty-four hours, whereas the normal patient excretes 7 to 22 per cent in twenty-four hours. As a check when there is 2 per cent or less excretion, the labeled B_{12} should be given with the intrinsic factor, and a concomitant rise in the excretion

to normal levels occurs in the patient with pernicious anemia.[7]

Pernicious anemia is treated with vitamin B_{12}, which can be given intramuscularly or orally with intrinsic factor. Needless to say, the former is the cheaper method. The daily requirement is about 1 μg. per day. Initially, the patient should probably receive approximately 100 μg. daily for ten to fourteen days and then 100 μg. weekly until a normal hemogram is present. Following this, a dose of approximately 2 μg. per day (120 μg. every sixty days) is quite adequate. The neurologic changes do not respond nearly as rapidly as the anemia but may show improvement continued for a year or longer. If the neurologic damage was severe, recovery may not be complete.

MALABSORPTION SYNDROME

Of the macrocytic anemias, the best known, with the exception of pernicious anemia, is that associated with sprue (malabsorption syndrome). This is typically a deficiency disease involving more than one system. The diagnosis can be suspected from the history, even though the diarrhea is often episodic.[8] The proof of the diagnosis depends upon roentgenographic demonstration of the typical deficiency pattern of the intestinal tract. The anemia is macrocytic and normochromic. Smears of bone marrow aspirate reveal a typical megaloblastic picture to the extent that it may be confused with pernicious anemia. In these cases, as in pernicious anemia, the uptake of radioactive vitamin B_{12} is low, but adding the intrinsic factor does not increase the absorption or subsequent excretion of the radioactivity as it does in pernicious anemia. The therapy is vitamin B_{12} which is administered intramuscularly. However, some patients may require steroids to completely control the diarrhea. The same picture of macrocytic anemia may appear in patients who have had fairly large portions of the intestinal tract resected for diseases such as regional ileitis. However, this point is often overemphasized.

HYPOCHROMIC ANEMIAS

Also, it is important to be aware of some of the varieties of anemia that are associated with other diseases of the gastrointestinal tract. Whereas many people think of macrocytic anemias as being associated with gastrectomy and liver disease, this is not always true. Actually, the hypochromic and normocytic and the hypochromic and microcytic anemias are more common than macrocytic anemias.[9] One such case of hypochromic microcytic anemia, which was noted five years after subtotal gastrectomy, would not respond to oral iron preparation but showed an excellent response to intramuscular iron-dextran complex and has remained in remission for over two years. Classically, the anemia associated with cirrhosis (other than hemolytic) is referred to as macrocytic. However, it should be borne in mind that individuals with cirrhosis can have esophageal and gastric varices which may bleed slowly and, thereby, cause a hypochromic microcytic anemia.

The finding of a hypochromic and normocytic or hypochromic and microcytic anemia in the postmenopausal age group is almost sure to be due to bleeding from one source or another, and, certainly, the most common site is the gastrointestinal tract. The lesions that most frequently cause bleeding are carcinoma of the colon or stomach or ulceration of the stomach or duodenum. However, it is wise, if no such lesion is found, to look for malignancies of the esophagus and small bowel. Other conditions that may bleed sufficiently to cause this type of anemia are ulcerative colitis, intestinal polyps, diverticulosis, and hemorrhoids. Even though the latter two conditions do not frequently cause this type of anemia, they should be considered as possibilities when found. The correction of the ane-

mia depends upon correction of the cause and the use of iron, preferably by mouth. However, in some cases of ulcerative colitis, and so forth, the patients' symptoms are aggravated by oral iron preparations, and a parenteral form should then be used. These will be discussed under the section on therapy.

NUTRITIONAL ANEMIA

Nutritional anemia probably does not occur nearly as often as it is diagnosed. Even though it is found in some countries,[10] it is probably quite rare in this country, and its existence is even doubted by some. This, of course, does not include that general group of anemias associated with errors of amino-acid metabolism but the anemia that is due to protein deficiency. The theory is that the supply of iron is adequate as well as the extrinsic factor but that the diet lacks sufficient protein for the synthesis of the globin portion of the hemoglobin molecule. This type of anemia is hypochromic. It is probably quite rare in this day and age for a person to be on a diet deficient in protein for a long enough period to cause nutritional anemia, but the possibility does exist.

ANEMIA ACCOMPANYING INFECTIONS

The anemia that occurs with chronic inflammatory or infectious states is not very well understood, but some important facts have been obtained about this condition. This type of anemia is found with such conditions as bronchiectasis and rheumatoid arthritis, and, in the older age group, it probably occurs most frequently with chronic urinary tract infections. This type of anemia is normochromic and normocytic. It is usually rather moderate in degree. The diagnosis is not always simple. A chronic infectious process of significant magnitude must be demonstrated, and the possibility of a hidden malignancy must be ruled out. Of course, with urinary tract infections, the factor of anemia due to nitrogen retention must also be considered. The pathogenesis of the anemia is not entirely understood, but some very pertinent points have been discovered. The first is that the red cells have a shortened life span, which, in some instances, has been quite pronounced. It has also been demonstrated that the serum iron is low, and the iron binding capacity is reduced. Another important finding is that when iron is given intravenously, it goes almost immediately to the tissues and has little effect on the serum iron level.[11] Also, the reticulocyte count is usually not elevated, and the aspirated marrow seldom shows the degree of increase of erythropoiesis that would be expected for the degree of anemia. These findings indicate that the basis of the anemia is that of shortened red cell life span with inadequate marrow response. Therapy consists primarily of removing the infection.

ANEMIA ACCOMPANYING RENAL DISEASE

In chronic renal disease, the degree of anemia is often significant, and, when the renal disease is severe, the anemia may be quite marked. It is usually normochromic and normocytic in type and is seen only when a rather pronounced degree of azotemia is present. It is probably due to the same mechanism as the anemia of chronic infection. However, various workers have not been able to associate it with products that are known to be retained in this condition. There is no satisfactory therapy for this condition.

HEMOLYTIC ANEMIA

To complete the discussion of anemias, mention should be made of the hemolytic types, which, as a rule, are normochromic and normocytic. However, except for those referred to in connection with other diseases, this type of anemia is unusual in elderly people. The one type that does deserve comment is that

associated with cirrhosis and splenomegaly. The laboratory findings for confirmation vary in appearance, but one should be able to demonstrate an increased number of reticulocytes in the peripheral blood as well as a normoblastic hyperplasia of the bone marrow. The serum bilirubin may or may not be elevated, and, with normal liver function, the elevation, if present, is slight. The most reliable test is the quantitative fecal urobilinogen excretion which is calculated according to the red-cell mass.[12] This has been shown to be more reliable than the Cr^{51}-labeled red-cell survival.[13] However, the Cr^{51}-labeled red-cell survival is a worthwhile procedure but, in the milder hemolytic states, may give a normal or borderline value.

Therapy

The therapeutic agents necessary for the treatment of anemia are actually few in number. This is not because of expense or scarcity but only the lack of necessity for more agents. Actually, iron, folic acid, vitamin B_{12}, and, possibly, cobalt preparations are the primary agents necessary in the treatment of over 90 per cent of the anemias. These preparations are effective if used as indicated, and only under rare circumstances, such as in the patient with pernicious anemia who has evidence of blood loss, need they be used in combination. Again, it should be emphasized that the so-called "shotgun" preparations are expensive and usually contain inadequate doses of hematinics and, on occasion, may cause more difficulty than the patient is already experiencing.

Iron is only required in the iron deficiency states as manifested by hypochromic and microcytic or hypochromic and normocytic anemias. Usually, in these patients, a low serum iron with a normal serum iron binding capacity is found. Certainly, many iron preparations for oral use are available today, and all are effective in treating iron deficiency anemias. The primary difference in these preparations is their likelihood of causing gastric irritation. The preparations contain ferrous salts, as it has been demonstrated that ferric irons are not absorbed across the intestinal mucosa. The salts that are available are ferrous sulfate, molybdenized ferrous sulfate, ferrous gluconate, and ferrous ammonium citrate. Of the first two salts, the usual dose is .3 gm. three times daily. It is usually best to give this after meals to lessen the possibility of gastric irritation. To obtain equivalent amounts of iron, larger doses of the latter two preparations must be used. Occasionally, a patient has a deficiency of hydrochloric acid, and the iron will be oxidized to the ferric state. In these individuals, it is often helpful to give the iron with 50 mg. of ascorbic acid, which keeps it in a reduced state. An occasional patient will not be able to tolerate any of the oral preparations, and, in such cases, parenteral iron is indicated. Until recently, the iron preparations have been for intravenous use and have been associated with a significant degree of reactions. However, there is at present an iron-dextran complex (Imferon) available which can be used intramuscularly and is quite safe. Before using parenteral iron, it should be remembered that there is no normal pathway for excretion of significant amounts of iron. For this reason, it becomes necessary to calculate the amount of iron necessary to raise the hemoglobin to normal. This can be calculated roughly in grams by multiplying the hemoglobin deficit (normal minus the 100 cc. initial hemoglobin) by the factor 0.255.

The indications for folic acid therapy in this group are rather few and limited primarily to tropical sprue and megaloblastic nutritional anemia. The dose in these conditions varies from about 15 to 100 mg. per day.

Vitamin B_{12} is indicated primarily in

pernicious anemia but is also used in cases of sprue with excellent results. The dosage of the intramuscular preparation was considered earlier under the section on pernicious anemia. It is certainly preferrable to the liver preparations, since it is less painful, less expensive, and associated with few, if any, side reactions. An oral preparation containing vitamin B_{12} and the intrinsic factor (dessicated hog stomach) is available and is adequately absorbed. However, it is quite expensive, and most patients prefer injections of B_{12}.

Indications for the use of cobalt and cobalt-iron preparations are in a state of flux. They raise the hemoglobin level and have proved to be the most effective agents in the anemia associated with infection. The mechanism of action of cobalt has, until recently, remained obscure. Recent work has shown that cobalt causes the release of a circulating factor, which is protean in nature and contains cobalt, and that this factor is capable of eliciting a reticulocytosis in another laboratory animal of the same species.[14] Its role in the therapy of anemias remains to be clarified.

Also, mention should be made of the use of corticosteroids in hemolytic anemias. They are most effective in the type of anemia associated with chronic lymphatic leukemia.[6] The dosage varies considerably between individuals, but practically all patients can be controlled on these preparations.

The use of transfusions for the correction of anemia has purposely been left until last, since they are indicated only in the face of severe anemia when life is endangered, when emergency surgery is indicated, or when there is no other method of raising the level of circulating hemoglobin. It should be remembered that with every transfusion, the possibility of serum hepatitis increases no matter how carefully donors are screened.

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Pathogenesis, diagnosis, and management of thrombophlebitis

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The factors which are conducive to venous thrombosis are prevalent in the geriatric patient and consist mainly of coagulability of the blood, injury to the vein wall, and venous stasis. The decrease in morbidity and mortality in recent years is attributed to early recognition and immediate treatment. The most effective agents in treatment are the anticoagulants heparin and Dicumarol used alone and in combination. Physical measures and vasodilating drugs are of additional aid when used judiciously.

◆ Thromboembolism is a major problem in all age groups, but particularly important in the older groups. Factors conducive to venous thrombosis are prevalent in the later years, and one must therefore be on guard for this complication in management of the ills of the elderly. The clinician must always be alert to the possibility of insidious deep vein thrombosis of the legs, especially in chronically ill patients who have been confined to bed.

Twenty years ago the incidence of death from thromboembolic complications was 25 in 10,000 medical and surgical patients admitted to the hospital.[1] A recent survey at Hahnemann Hospital during the years 1949 to 1951 revealed deaths from thromboembolic complications to be much less and in the range of 0.4 deaths per 10,000 medical admissions and 1.3 per 10,000 surgical admissions.[2] This significant reduction in the statistical incidences of death from pulmonary infarction which has taken place over two decades may be credited to the earlier recognition and more effective treatment by the medical profession.

Classification

A classical distinction is made between "phlebothrombosis" and "thrombophlebitis" as described by Ochsner and DeBakey.[3] In phlebothrombosis, the venous occlusion is caused by an intravascular thrombus which is not associated with inflammation of the wall of the vein and which is loosely attached to the wall. In thrombophlebitis, the intravascular thrombus is dependent upon inflammation of the wall of the vein and firm mural attachment is found.

When a phlebothrombotic process has occurred, a secondary phlebitis develops after several hours as a reaction to the thrombus. From a clinical and pathologic point of view, the differentiation of these terms is of no true significance. The term "thrombophlebitis" would appear to be inadequate for this discussion.

Thrombophlebitis may be classified as follows:

1. Primary thrombophlebitis. In this condition, there is no underlying disease process or injury to the vein wall, such as recurrent idiopathic thrombophlebitis.

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2. *Local thrombophlebitis.* This is a result of some injurious agent involving the wall of the vein, such as an infectious or suppurative process. Included in this group are trauma and chemical irritation of the vein. Such irritation may follow prolonged use of intravenous infusion, and is frequently experienced in routine hospital practice. It presents no clinical problem other than the discomfort and swelling experienced by the patient. The thrombus resulting from the inflammatory reaction in the wall of the vein maintains strong adherence to the wall and is not prone to break away and embolize to the lung.

3. *Secondary thrombophlebitis.* This type is found complicating numerous clinical entities such as the postpartum state; surgery, particularly abdominal and pelvic surgery; infectious diseases, such as typhoid fever and pneumonia; blood dyscrasias, such as leukemia, polycythemia, and anemia; heart diseases, such as myocardial infarction and congestive heart failure from any cause; malignancy; diabetes mellitus; dehydration; rheumatoid arthritis; and collagen diseases; and is also found after the use of steroid agents, such as cortisone and ACTH. Secondary thrombophlebitis presents the highest percentage of clinical problems and demands the earliest possible recognition so that effective treatment can be employed in order to decrease frequency and severity of complications.

Since the occurrence of secondary thrombophlebitis is common to a large group of unrelated clinical entities, there appears to be no common denominator to explain the process.

Pathophysiology

The most common site for initiation of the process appears to be the deep veins of the lower extremities. Statistically, it occurs twice as often on the left side.[4,5] Initiatory factors include the coagulability of the blood, injury to the wall of the vein, and venous stasis. In almost all instances of secondary thrombophlebitis, there is no overt disease or injury to the vein wall. The thrombosis appears to be the primary component, and the secondary reactive phlebitis may occur to varying degrees.

Restriction of activity is rather common to a number of patients afflicted with deep-vein thrombosis. Cardiac, postpartum, and postoperative patients, as well as those suffering from trauma, infectious disease, and so on, at times must be put to bed for prolonged periods. The rate of venous flow in the lower extremities has been shown to decrease progressively during the immediate postoperative period.[6] Venous stasis is certainly present in congestive heart failure. Yet this one factor cannot explain why thrombophlebitis is not a more common complication.

The mechanisms of blood coagulation are complicated and authorities are not in absolute agreement on the true sequence of events in this coagulation process. In general, coagulation time in silicone tubes at 37° C. has been shorter for patients with thrombosis than for normal persons. However, results of actual tests for coagulation factors by various investigators are not in agreement and are subject to many technical errors. No one factor in coagulation or hypercoagulability has been demonstrated as a common basis for secondary thrombophlebitis.

The onset of the thrombophlebitic process is insidious. A small thrombus becomes adherent to one of the venous trunks in the leg. By the deposition of fibrin and red cells, the clot is propagated through the vein in the direction of the blood flow. There is a secondary, aseptic, inflammatory reaction in the wall of the vein with resultant periphlebitic edema and venospasm. The edema may be pronounced as a result of

venous hypertension, lymphatic obstruction, and capillary hypoxia. When the inflammatory process is severe enough, arteriospasm occurs in the involved area. The degree of symptoms and extent of physical findings are determined by location of this process and the length to which it has been propagated. As the clot grows centripetally and the iliofemoral segment is involved in the phlebitic process, then the picture of phlegmasia alba dolens or phlegmasia cerulia dolens appears if the process is extensive enough. The free-floating, eel-like portion of the clot may dislodge itself at any time, giving rise to the symptoms and signs of pulmonary infarction.

Diagnosis

The clinical diagnosis of thrombophlebitis may be made early if the clinician is constantly on the lookout for the earliest signs. The patient's pulse and temperature should be observed closely. Unexplained elevation of pulse, temperature, and apprehension in the bed patient should alert one to the possibility of deep-vein thrombosis. Recurrence of fever or pulse elevation in the postoperative period must be regarded with suspicion. The process may be present without revealing itself clinically and may be brought to the physician's attention by evidence of pulmonary infarction before leg symptoms or signs are manifest.

No complaint relating to the lower extremity, no matter how vague, should be disregarded. A meticulous examination of the calf for localized tenderness and edema over the area of the deep veins should be repeated frequently. A positive Homan's sign may be corroborative of the local findings and measuring the calves may reveal an inequality in their circumferences.

Inflation of a blood pressure cuff to 40 mm. Hg on the thigh may produce acute pain in the area of the phlebitic vein of the calf, and, with release of the pressure in the cuff, pain should dramatically disappear.[7] This is a helpful method in differentiating pain of deep-vein phlebitis from nonspecific calf muscle tenderness. One should be aware of the varied syndromes produced by pulmonary embolization particularly in those patients prone to develop thrombophlebitis.[8] The diagnosis of pulmonary infarction automatically infers the presence of the insidious subclinical thrombophlebitic process and therapy must be instituted immediately.

Prophylactic Therapy

The prophylactic use of anticoagulants is unquestionably the most effective method for prevention of deep-vein thrombosis. However, this method has very few adherents. The major exception is their use in patients with acute myocardial infarction in order to prevent thromboembolic complications. Although there is controversy as to whether all patients with acute infarction or only a selected number should receive prophylactic anticoagulant therapy, it is generally agreed that the method has great merit.

In similar fashion, prophylactic use of anticoagulants should be considered for surgical patients who have previously experienced postoperative thromboembolic complications and also for women who have had postpartum phlebitis and who are again at term. We have employed anticoagulants in these circumstances many times during the postoperative or postpartum period and, in our opinion, their use seemed justifiable. This seems to be a reasonable approach, since these patients are "known susceptible" individuals and the factors predisposing to venous thrombosis are more apt to recur. Other methods of prophylaxis, such as early ambulation after surgery, leg exercises, and application of ace elastic bandages[9] to prevent venous stasis in the lower extremities, are in general use to-

day. It is conceded that attention to these details has significantly reduced the incidence of venous thrombosis, even though it is difficult to estimate to what degree. In medical patients who require prolonged bed rest, particularly old patients and those with cardiovascular illnesses, use of these measures is limited. One must therefore be acutely observant in order to detect the earliest signs of thromboembolic phenomena and institute treatment before extensive thrombi or signs of pulmonary embolism develop.

Therapeutic Agents and Methods

ANTICOAGULANTS

Anticoagulants are now universally accepted as the most effective agents for treatment of deep-vein phlebitis with or without pulmonary embolism. Used properly, these agents are so efficacious that other methods of therapy, such as vein ligation, are rarely necessary. The major aim in therapy is to prevent extension of the thrombotic process, particularly at the proximal portion of the clot where it is less adherent and more apt to form an embolus. Aside from their use in preventing formation of pulmonary emboli, they are used primarily to prevent further destruction and loss of the venous valves. This decreases the severity and degree of postphlebitic sequelae, such as chronic leg edema, stasis changes, and leg ulcers. Treatment should be instituted as soon as venous thrombosis has been diagnosed. Aqueous heparin and bishydroxycoumarin (Dicumarol) or its derivatives are the drugs universally utilized either singly or in combination.

Heparin

Aqueous heparin has many advantages over the coumarin agents. It has an immediate effect on the coagulation mechanism and should therefore be employed in all cases initially. Also, its action is predictable. It is rapidly excreted so that the complication of bleeding, if it occurs, is readily controlled. It can be given intravenously, intramuscularly, or subcutaneously. Bauer is an advocate of the intermittent intravenous method and utilizes this route almost exclusively.[10] As will be described later, we use the intermittent subcutaneous method in most instances and have found it clinically effective. Heparin has the disadvantage of being impractical for prolonged use, no matter what the avenue of administration.

Dicumarol

This anticoagulant or its various derivatives is an effective agent when properly employed. In most instances, constant therapeutic levels can be maintained. We prefer Dicumarol and have continued to use it instead of the derivatives. The disadvantages of Dicumarol are: delay of effect for twenty-four to forty-eight hours, inability to maintain constant therapeutic levels in approximately 15 per cent of patients, significant incidence of bleeding, and need for frequent estimations of prothrombin activity. Despite these disadvantages, this anticoagulant has been therapeutically effective in the vast majority of the patients treated by us and others. We have encountered only occasional minor episodes of bleeding and no deaths from hemorrhage. Its greatest advantage is that it is more practical when prolonged treatment is necessary.

Combined Therapy

The combined use of heparin and Dicumarol is the method most frequently used at the present time. When the prothrombin time has increased sufficiently to indicate adequate Dicumarol effect, heparin is discontinued. We use this approach with some modifications. When there is advanced and severe iliofemoral involvement, such as thrombophlebitis cerulea dolens; when there has been a

delay in initiating therapy; and, in all instances, when a pulmonary infarction has occurred, the following method is recommended.

Heparin is given intravenously, 75 to 100 mg. every four hours for the first twenty-four hours, then subcutaneously in the same dose for five to seven days, even though the prothrombin time has reached therapeutic levels by means of the concomitant use of Dicumarol. In all other instances, heparin is given subcutaneously at four- to six-hour intervals in a similar dose schedule. It has been our policy to have a Lee-White venous coagulation and a prothrombin time done before the first dose of heparin and Dicumarol. The coagulation time is repeated before a scheduled dose of heparin at some time during the next twenty-four hours in order to be certain that an abnormally prolonged effect has not developed. This is done only when the subcutaneous route is used. In the majority of instances it is not repeated again.

Along with the first dose of heparin, 200 mg. of Dicumarol is administered orally. Daily prothrombin estimations are done before the next dose of Dicumarol is given. Heparin also influences the prothrombin time and this must be taken into account when combined therapy is in effect. We attempt to maintain a prothrombin time of two to two and one-half times the control value, or approximately 15 to 20 per cent of normal. When this therapeutic level is attained, the aqueous heparin is discontinued except under those circumstances mentioned above.

After seven to ten days of an effective therapeutic response, the prothrombin time may be done every other day or twice weekly, depending upon the individual response to the drug. Anticoagulants are administered on the average from two to six weeks, depending upon the extent of involvement or upon the necessity for prolonged bed rest for an associated systemic disease, usually cardiovascular in nature. Patients are made ambulatory before anticoagulants are discontinued, except those whose illness requires a prolonged period of bed rest. In this latter group, anticoagulants are continued for an indefinite period.

VEIN LIGATION

Although there is infrequent need for vein ligation, occasionally circumstances arise in which we feel this procedure is indicated. Such situations are: cases of recurrent pulmonary embolization despite adequate anticoagulant therapy, cases in which anticoagulants are contraindicated, and cases in which emboli occur when adequate therapeutic levels cannot be maintained. If an embolus develops while the patient is on Dicumarol therapy alone, even though at satisfactory therapeutic levels, in most instances another course of heparin is instituted before vein ligation is considered. We believe surgical intervention is required only as a life-saving procedure to protect the patient from massive pulmonary infarction. Ligation does not affect therapeutically the course of the phlebitic process and, in many instances, may add greater disability to the extremities, depending at which level ligation is performed.

When the deep veins of the calf, the popliteal or lower part of the femoral vein, are involved, ligation of the superficial femoral vein is performed. This must be done bilaterally. Ligation of the superficial veins may not result in complete protection, for the cephalad end of the thrombus may extend above the lower segment of the femoral vein. There is no method by which the extent of the free-floating clot can be determined by physical examination. This may explain the significant incidence of pulmonary embolism after ligation at this level. If the iliofemoral or pelvic veins are in-

volved, ligation of the vena cava is indicated. Even when surgical intervention is performed, anticoagulants are reinstituted twelve hours later if no contraindication exists.

VASODILATOR DRUGS

This type of therapy plays a secondary role in the treatment of deep-vein phlebitis. Various types of agents with different modes and sites of action are available.

Rather than discuss a number of these drugs, we shall describe one of them which has been most effective in our experience—tetraethyl-ammonium chloride (Etamon). This drug is given to those individuals in whom the phlebitic process is severe and associated with marked pain, fever, edema, coldness, and cyanosis of the limb. Etamon is given intravenously in doses of 200 to 400 mg., at twelve- to twenty-four-hour intervals. It is given slowly, and blood pressure readings are taken frequently so that the rate of injection can be controlled without producing a precipitous fall in blood pressure. Attention to this detail is particularly important in the elderly or in those patients with severe hypertension. The drug is not given in those individuals who have had a recent myocardial infarction. While the measurable effect of the drug is brief, the therapeutic effect persists for several hours and helps to relieve pain, coldness, and, to some extent, any associated arteriospasm which may be present. The drug is discontinued after the acute signs and symptoms have subsided, usually after three to five days.

Another method to obtain vasodilatation when severe pain and vasospasm are predominant features is anesthetization of the paravertebral ganglia. This procedure was recommended by Ochsner and DeBakey in the early 1940s.[11] Since the immediate use of anticoagulants is imperative in the treatment of thrombophlebitis, the concomitant use of paravertebral block presents a real risk of retroperitoneal hemorrhage. Our results with Etamon have been sufficiently satisfactory in relieving symptoms associated with vasospasm so that we find no need for paravertebral ganglion block. In addition, use of Etamon does not add to danger of hemorrhage.

ANTIBIOTICS

A few words concerning antibiotics seem proper since they are used so frequently. As we have mentioned, there is an aseptic inflammatory reaction in the secondary phlebitic process. We do not use antibiotics routinely in treatment except when an associated systemic illness requires their use.

PHYSICAL MEASURES

The principal physical measures consist of elevation of the extremities, application of local heat, and elastic compression. The common procedure of elevating the leg on pillows is to be avoided, for the leg cannot be maintained in one position and pressure points may arise. A more efficient method is to suspend the lower end of the bed spring which results in more comfort and avoids compression of the lower extremities. Many of these patients have associated arterial diseases, a factor which must be considered before instituting prolonged elevation. Because of edema, one may not be able to determine the presence or absence of pulses by palpation. Therefore, it helps to inquire about symptoms indicative of arterial insufficiency. Oscillometric readings may also help in excluding the presence of occlusive arterial disease. When it has been determined that arterial insufficiency exists, it is best to use intermittent elevation. An oscillating bed is ideal.

Local heat to the involved extremity is used temporarily during the acute stages. Moist heat seems to be more advantageous, providing moist dressings are

not allowed to cool. This measure results in symptomatic relief and probably has no actual physiologic effect. Heat must be used judiciously in the presence of arterial occlusive disease. Elastic compression of the extremity is used only at the time ambulation is instituted. Since elastic compression is necessary for indefinite periods, form-fitting elastic stockings are employed. Where iliofemoral phlebitis has occurred, we prefer the use of thigh-length stockings. This measure must not be taken lightly, for many complications, such as edema, will otherwise develop because of the damaged valves of the deep venous system. Along with the use of compression, the patient is instructed to avoid prolonged standing and is advised to elevate the extremity as often as possible.

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INABILITY TO VOID after operations on the rectum and sigmoid is often observed in men within the age range in which prostatism occurs. Although preoperative urinary symptoms may be absent or minimal, the surgical trauma and resultant loss of support of the base of the bladder, vesical neck, and prostatic urethra combine to produce mechanical deficits sufficient to derange physiologic balance and allow the bladder to decompensate.

If an indwelling urethral catheter is kept in place for at least one week after operation, most patients will regain satisfactory bladder function spontaneously within a period of two to four weeks. If conservative management during the two- to four-week postoperative period is not successful, a transurethral resection of the prostate should be performed. Such early aggressive therapy, if well done and repeated when necessary, produces immediate excellent results in more than 90 per cent of patients.

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A depressive retirement syndrome

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Symptoms of a depressive type are often evoked as an expression of the emotional meaning of retirement. The known facts of psychopathology can be applied to explain this syndrome logically. Some additional observations on the meaning of work are included.

◆ An increasing body of medical literature concerns itself with various aspects of retirement. Economists, sociologists, families of persons who are retiring, and retirees themselves show by their multiple concern that this is a problem of wide interest, but nonmedical writers seem to dominate the field of retirement literature. Physicians who set down their thoughts on the matter are usually doing so from a personal, philosophic viewpoint.

I should like to approach this subject as a clinical medical entity, which can be compared with other illnesses. It becomes again the reasonable province of the physician who bases individual treatment upon specific pathology. Wide excursions into the ills of society and environment are unwarranted and tend only to complicate the picture presented by the individual office patient. I plan to present observations about a commonly encountered depressive retirement syndrome, which will serve to emphasize psychopathology occurring at this age. It is only by keeping this pathology in mind that rational diagnostic and treatment attitudes can be maintained.

The Symptoms of Retirement

For some people, approaching retirement is a time for happy contemplation of well-earned leisure. For many persons, there is simply more time and plenty of energy for previously latent maladjustment to come to full bloom and dominate all spheres of living. These people are usually seen first by their family physicians, but they present themselves in a variety of disguises. There is increasing opportunity for diagnostician and specialist employed by large companies in their medical programs to observe these persons early in the course of their syndrome. Even though the patient suffers considerable discomfort, he is apt to postpone medical consultation because he considers his symptoms to be a part of his "normal" personality. He is used to himself. For this reason, he finds it difficult to describe his symptoms and their effects. He is particularly indefinite about the time of onset of various symptoms. It is apparent that much of his maladjustment has been experienced and dealt with in some manner for many years. We say his defenses have been egosyntonic—in harmony with the ego.

Symptoms most commonly complained of or elicited readily in history taking are:

Subjective depression
Insomnia
Loss of usual interests
Lessened concentration
Lack of satisfaction in any undertaking

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Social retreat
More fears
Hypochondriasis
Gastrointestinal symptoms
Sexual symptoms

Patients are apt to interpret their symptoms in some relationship to their work—past, present, or future. Some will dwell on the various inequities and vicissitudes of the past employment situations; others experience a day-to-day anxious preoccupation with present work arrangements; and still others anticipate the future work arrangement, particularly retirement, with considerable foreboding.

It is interesting that all of these symptoms can be described in nonpersonal terms—that is, the patient almost never says that he is having trouble in his personal relationships at the office. He sees other persons as hard to get along with, but there is almost never the statement, "*I* am having difficulty with the boss." Such a person seems incapable of admitting his own responsibilities in his fate. The state of the ego would seem to be such that no additional blame can be assumed. In contrast, everything can be wrong with the boss, the company, work policies, the community, and the country in general.

The same inability to look subjectively at oneself is elicited in the history of past personal relationships. Various degrees of social difficulty have been known by their effects on the patient's life, which he can hardly ignore. These vicissitudes are proportionately more noticeable in his closer relationships, as with wife and family. He is apt to be a doer, and, if there is nothing to do, life is intolerable. Doing seems to be the only method he knows of gaining his sense of being.

In some ways, this set of symptoms resembles involutional melancholia; the retirement syndrome, however, differs in these respects:

- It is more closely associated with the age of, or prospects of, retirement.
- It tends to be more chronic.
- It has less severe subjective depression, and guilt and self-accusatory attitudes are absent.
- It is not apt to be self-limited.
- It does not produce a psychosis.

The premorbid personality of the involutional depressed person is more standardized. In comparison, these patients show more neurotic symptoms and defenses during their childhood, adolescence, and previous adult life; these neurotic personality patterns are quite diverse.

Case Histories

Extracts from four psychiatic consultations follow. These four patients presented themselves for diagnostic survey because of physical symptoms. They were referred by their family physicians and one or more internists.

Case 1. This 57-year-old man complains chiefly of gastrointestinal symptoms, anxiety, irritability, and depression.

He describes a lifelong personality makeup which has not been altogether ideal. Although he has worked as a creative architect, he is always thinking in terms of things being routine, normal, and under control. He has taken considerable interest and pride in his work but has noticed much stress in dealing with various personalities. He wants things to be definite and settled, which they almost never seem to be. In anxiety-producing situations, he tends to become somewhat annoyed, irritable, and depressed. At these times he is apt to be more concerned about his own bodily functions, to exhibit some transient symptoms, and to have difficulty sleeping. His tendency to feel depressed is somewhat progressive, although it has never been serious enough to warrant special attention. He seems somewhat overconcerned about his decreased interest in sexual matters and potency.

He speaks of several ways of making things easier, but these are mostly environmental

factors. Most of these methods he has only thought about and has not put into effect. He is reluctant to make rational plans about cutting down on his work and responsibility.

Case 2. This 49-year-old man complains of recurrent headache, other aches and pains, spells of depression, and forgetfulness.

This patient is the oldest of four children. His mother died when he was 17, and he was left to take considerable responsibility for his brothers and sisters, for the father set a poor example in his personal and social life and tended to neglect all of the children. The father died at the age of 60 from a progressive organic brain disease which kept him institutionalized during the last two years of his life. The patient took great interest in his siblings even after his own marriage, bringing some of them to live with him. He took two of his brothers into the business with him and later realized that they were surreptitiously robbing him for his kindness.

The patient himself has had a rather erratic personal and occupational life. He left school at 14, and later continued his education by correspondence. He has been a "pug," a hired strike breaker, a welder, a contractor, and, finally, a manufacturer. During the latter years, his business prospered greatly and he found it financially advantageous to dispose of it a few years ago. Since then, he has lived in semi-retirement with an interest in several business enterprises which in turn have also prospered.

His two marriages have not turned out ideally. During his first marriage, he began to spend more and more time away from home, which resulted in a total emotional estrangement from his wife. In 1949, after living in a hotel for two years, he suddenly married his former secretary. She is fourteen years younger than he is, and is described as a first generation "Pole," not very gracious in manner, and with little intellectual attainment. A daughter by his first marriage, now aged 26, is close to the patient emotionally. In some ways, he remains quite ambivalent about his present marriage.

He describes periods of subjective depression occurring in a rather cyclic pattern during the past ten years. There is some reason to believe he may previously have functioned on a hypomanic level, at least part of the time. He never required much sleep and devoted a good deal of energy to constructive accomplishment in his business. He did not appear depressed at a recent office visit, but said that he felt a migraine attack coming on which would last for two to three days. Formerly, he noticed that he would be most apt to get a migraine attack every Thursday. He finds most of his present activities neither interesting nor satisfying. His intellectual interests are rather wide; hunting and fishing have constituted an extensive hobby.

Apparently no physician has taken this patient seriously enough to suggest that he might be treated for his emotional illness. Before coming to the clinic, the principal advice he has had has been to get away and take a vacation. He has a definite neurotic personality disorder with cyclic mood swings as the predominant clinical feature.

Case 3. This 60-year-old man complains of gastrointestinal symptoms, irritability, and apathy. He is most disorganized and erratic in describing complaints that are of interest psychiatrically. Many of these difficulties are so much a part of his usual emotional make-up that he does not think of them as being symptomatic. He tends to assume that everyone has stomach and bowel trouble when there are decisions to be made.

The patient is an only child of an English father and Pennsylvania-Dutch mother. His parents separated when he was 16, apparently becouse of his father's alcoholism. He went to the eighth grade in school and began quite early to live the life of an adult. He took care of himself in all ways and was quite independent. His first marriage ended in divorce after nine years. His second and present marriage is described as successful, but little else. His wife is said to have had a "nervous condition." Their two teen-age boys have been stationed in various schools away from home and the younger one has apparently been somewhat of a behavior problem. The attitude of the patient toward his wife and children is inhibited and defensive.

This patient seems to have gone along without exhibiting neurotic symptoms as such, but his whole adjustment in all spheres has been immature and neurotic in character. This neurotic make-up has been consistent with financial success but with little

else in the way of satisfaction. He does not react in the expected way to rest, leisure, hobbies, or cultural interests. His whole adjustment has been so self-centered that other things and other people have relatively little meaning. His emotional adjustment at this time is simply an exaggeration of his usual neurotic life.

Treatment by psychotherapy is nearly impossible. The extent of his potential insight is that he either needs to go on another trip immediately or see his wife's fortune teller.

Case 4. This 56-year-old man has had a variety of complaints with previous diagnoses of bursitis, neuritis, peptic ulcer, and migraine.

The patient's childhood and early life are not unusual in an external sense, but it would appear that his emotional development was handicapped considerably. His own father died when he was 2, and his mother later remarried three times. He recalls being anxious and "on the verge of St. Vitus dance" which prompted his spending a summer in the country. He believes he has always functioned with considerable tension, felt as tension itself or as a condition in various organs or systems. Tension is now most apt to be felt "in the stomach."

His adult life has been that of the typical business man. Without basic qualifications, he is president and main executive of his own company. Business is always pressing and he has felt unable to take any real vacation. He is unable to delegate authority, assumes entirely too much responsibility, and feels that he must personally supervise details of his larger accounts. He becomes more tense and is apt to be depressed when things go somewhat unfavorably in the office. He is always overtired, likes to eat a little too much and regularly needs a drink or two upon getting home from the office. He maintains a home which he cannot afford and has made little provision for the future either financially or emotionally. He thinks he might like to retire if this were possible, but doubts if he could relax enough to do so.

This patient has little ability to think of himself in an emotional sense. He describes his various symptoms and reactions almost as though they belong to someone else. Any suggestion for influencing his emotional state is purely by manipulation of external circumstances. He has little emotional elasticity, and he is apt to find symptoms more upsetting than they should be. Intangible values have little meaning. With this lack of insight and inability to develop insight, it is hard to influence this picture. The patient may become more anxious or more depressed as time goes on, depending mostly upon external circumstances.

Discussion

Happy retirement is a function of maturity; it is not attained otherwise. Since ideal maturity is never attained, we find a variety of psychologic pathology in man's attempts to retire.

In these case histories, it is apparent that retirement has a special, vaguely threatening connotation. It accents a defect which has been going on for almost a lifetime. Taking a closer look at these patients, we see that their work, from which they are reluctant to retire, has not been ideal either.

Their work has also been characterized by immaturity. Work, just as retirement, has been the chief expression of neurotic conflict and therefore has not actually been of the great value which these patients place upon it when asked to give it up. People are apt to refer to their wonderfully pleasant and satisfying work which has to be put aside. They often mean that work has been an indispensable crutch, which cannot be readily discarded. Work has been reaction formation, rather than true sublimation. When one hears, "he was completely devoted to his work," it may mean that the person was emotionally equipped for work only.

There is much need to clarify the roles of underlying pathology and precipitating influences. The casual observer is apt to see only realistic events and forget the personality which is faced with these events. This neurotic picture is apt to be ushered in by a threat to the ego or by additional occurrences such as physical illness, death of a wife, promo-

tion, or failure to get a raise or promotion. These patients become disabled because of their own psychologic make-up, not because of family, social, economic, and physical limitations.

By far the most common emotional problem of middle and older life is that of neurosis—an extension of the normal-neurotic personality make-up of years before. Qualitatively, this is the same personality, but external factors tend to influence it quantitatively. Employment practices and social and economic pressures are added to existing personality problems. This is not a disease of society, but one of individual psychopathology, often projected onto social institutions.

I do not believe we can consider retirement symptoms as an outgrowth of modern civilization.[1] It is surprising to see how many writers still assign the ills of age to physical, social, and psychologic factors. They discuss the causes of physical and social symptoms, but the psychologic factors are simply stated, as if to take for granted that they come from the social and physical aspects, are natural with age, or have no cause at all.

This neurotic depressive reaction is only indirectly related to retirement. The patient insists upon the connection, and in so doing reveals something from his unconscious. There is every reason to examine the person of 65 with the same attention to the unconscious as we do the person of 5, 15, and 25. We are not satisfied to say that the patient of 5 is ill because life demands he start to school, or is ill at 25 because he has gotten married.

Retirement accents a defect already going on. Persons with retirement symptoms have usually functioned in work as passive recipients of implied approval, acceptance, and appreciation. The pay envelope tends to verify this.

Much of the clinical picture in these individuals is explained by a single bit of psychopathology: inability to cathect human objects unambivalently. Work lends itself to expenditure of energy in a relatively safe, impersonal orientation. When the worker stops, for a night or for the rest of a lifetime, he feels pressure from society to invest more emotionally in other human beings. He is more or less forced to relate to his wife, children, and neighbors; he does so according to his ability. But his capacity to derive satisfaction from these relationships is limited, and the emotional needs continue. As a result, the compromise formations —those previously listed as presenting symptoms—arise. This syndrome is pathologically similar to "vacation neurosis," "Christmas neurosis," and "Sunday neurosis;" it is certainly one type of retirement neurosis. In all these situations, we are confronted with what should be easier, more pleasant activities. But in order to enjoy these activities we must be able to love people with little ambivalence.

It has been suggested that we lack a philosophy of aging.[2] I think it is more accurate to say that our philosophy of aging is rather definite: it is that we expect each individual to formulate his own philosophy of aging, and to do so successfully. We do not respect age just because it is old, but we do value the aging process and method characterized by maturity. We penalize immaturity at any age, or rather, the immature person penalizes himself. Some degree of introspection accompanies the development of a philosophy; these people have typically fled from themselves to concrete, inanimate objects in the external world. With retirement, the inevitable facts of environment become disproportionately important. Thus these persons seem to have no usable philosophy of life at an age when they need it most.

Treatment of these conditions will not be discussed here. Some treatment principles can be related readily to the pathology which has been described. Per-

sons with depressive retirement syndrome react as if a loved object has been taken away and they are deserted. Sending these patients back to work is not a panacea. Vacations may give more time for introspection, and lead to further depression. Fish do not talk back, but the patient may get pretty tired of his own company. He needs companionship, but may find it easier to accept the company of a passing acquaintance than that of his wife and children. Advice and platitudes meet a cold reception, for these persons hardly understand planning in the usual sense. Neurosis is potentially treatable at any age, and some of these people with depressive retirement syndrome can utilize psychotherapy to their benefit.

This presentation may seem to sound a pessimistic note regarding a large and difficult problem. It is not intended as such, and is not so, if it lends, even slightly, a more accurate orientation to this period of life.

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WITH THE EXCEPTION of the virus papilloma, most papillomata arising in the urinary and alimentary tracts, the ducts of the breast, and the skin occur in people over 50. At any site, papilloma is a potential source of cancer. Clinically, it is difficult to determine which growths will become malignant. Benign and malignant lesions may arise side by side, suggesting the whole area contains foci of potential tumors.

The stimulus to the dividing cell may be produced by direct chemical stimulation; by a virus attack, which itself is probably a disturber of cellular biochemistry; or by a simple mutation. Growths on the skin are probably caused by some stimulant. In the mouth the growths are commonest on the pillars of fauces and on the soft palate.

The adenopapilloma of the alimentary tract is most often found in the rectum. The stimulant has the greatest opportunity of access because the feces are harder and more traumatic at the rectum. Also stagnation is greater here than in the upper reaches of the bowel. In the bladder the papilloma is most common near the ureteric orifices.

The multiplicity and coexistence of papilloma and carcinoma is probably due to multifocal neoplastic change in an area of tissue. The different phases of the change, varying from papilloma to malignancy, both without and with invasion, may be present either simultaneously or at different times.

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Diabetes in the aged

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Diabetes is a frequent problem in the aged population; one survey indicates that in 46 per cent of patients developing diabetes the onset is after age 50. While hyperglycemia and insulin requirements are on the average less than in the young, arteriosclerosis and its sequelae, ophthalmic problems, and diabetic neuropathy are often major causes of disability in the older diabetic. Treatment of the aged patient with diabetes is discussed.

◆ As a result of the use of insulin, the increased understanding of the pathophysiologic mechanisms of diabetes, and the improvement in therapeutic regimens, many diabetic patients are now living as long as the nondiabetic. As the well-educated diabetic patient tends to avoid excesses and dissipations which are often freely indulged in by the nondiabetic population, it is the thought of some that he may outlast his contemporaries. The 20 patients recently reported by Root and Barclay[1] who lived to the age of 80 after having had diabetes for thirty-five to forty-six years are a dramatic testimonial to the improvement in diabetic care.

Comparable advances in therapeutics have also occurred in other fields of medicine. The result of this has been an increased longevity of the general population. As diabetes mellitus has a peak onset during the sixth decade, a greater number of prediabetic individuals are now living long enough to develop overt clinical diabetes. In a group of 4,690 diabetics admitted to the New England Deaconess Hospital during a recent two-year period, 447 patients, or 9.5 per cent, were between the ages of 70 and 90 years.[1]

As a result of these two factors, diabetes mellitus is now one of the major problems of the physician who is concerned with the geriatric patient.

Incidence

In 5,329 diabetics seen by Joslin and associates[2] from 1939 to 1947, the onset occurred after age 40 in 68 per cent of cases and after age 50 in 46 per cent (figure I). The peak onset occurred in the group 50 to 54 years of age. In almost 50 per cent of the patients, the onset occurred in the twenty-year period from ages 40 to 59. Following this period of peak incidence, a sharp decline occurred and there were less than 5 per cent in whom the onset occurred after age 70. From these data, it can be seen that diabetes is a disease which begins predominately in middle-aged people. This agrees with the conclusion in regard to etiology stated by Joslin[2] "that diabetes is not an old-age disease."

There is temptation to relate the onset of diabetes to changes occurring in other endocrine functions, since adrenal, thyroidal, gonadal, and pituitary functions are also known to decline at about the sixth decade. It is interesting to note here that the other peak in incidence of onset is in the 10 to 14 year age group, again a time when functional changes

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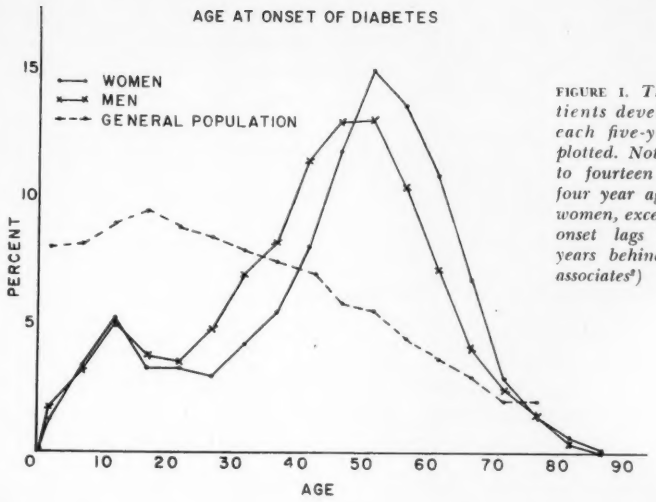

FIGURE 1. *The per cent of patients developing diabetes in each five-year age period is plotted. Note peaks in the ten to fourteen and fifty to fifty-four year age groups. In adult women, except for the aged, the onset lags approximately five years behind men. (Joslin and associates[2])*

are occurring in the endocrine system. Whether there are marked alterations in secretion of pituitary growth hormone, a factor known to produce diabetes in experimental studies with animals, cannot be definitely stated because of lack of data.

Since the onset of diabetes occurs in the majority of patients after age 40, and since diabetics are now living longer, it is obvious that diabetes is one of the major diseases of the elderly individual. In addition to these patients with known diabetes, there are undoubtedly a large number of undiagnosed cases, and of particular importance is the fact that there is a greater percentage of undiagnosed patients in the older age group than in the young. In a recent series reported by Chesrow and Bleyer,[3] 1,000 patients over 60 years of age were screened for diabetes. Although none was suspected of having the disease prior to testing, 6.4 per cent had diabetic glucose tolerance tests and an additional 2.4 per cent were classified as potential diabetics because of less marked abnormalities in the test.

Characteristics

While there is no conclusive evidence that the etiology of diabetes is different in the aged individual as compared with the younger subject, it may be significant that the average insulin content of the pancreas of adult diabetics is on the average of 30 per cent or more of normal, while, in juveniles, it is usually less than 10 per cent of normal.[4] It is entirely possible, however, that this may reflect only that there is an increased requirement in the young which leads to a greater depletion in these individuals.

At the same time, there have been a number of studies concerned with the utilization of carbohydrates in the aged. Albanese and associates[5] studied the effects of age on oral glucose and fructose tolerance tests in a group of 44 nondiabetic subjects ranging from 5 to 89 years of age. These studies indicated that while utilization of fructose was not affected by age, there was a progressive decrease in glucose utilization, glucose being utilized 15.6 mg. per cent per hour slower than fructose in the group 5 to 15 years old, 21.0 mg. per cent per hour

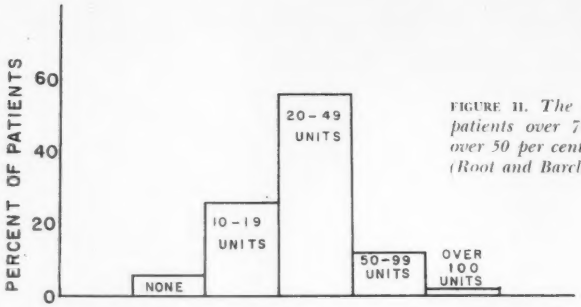

FIGURE II. *The insulin requirements of 447 patients over 70 are illustrated. Note that over 50 per cent require from 20 to 49 units. (Root and Barclay[1])*

slower in the group aged 20 to 60 years, and 41.9 mg. per cent per hour slower in the group 61 to 89 years of age. Since similar results have been obtained in regard to glucose tolerance by Schneeberg and Finestone[6] after intravenous administration of glucose, it would seem that differences in absorption from the gastrointestinal tract are not a major factor in this decline. In other studies Smith and Shock[7] have concluded that the prolonged glucose tolerance curves in presumably nondiabetic elderly subjects are probably not due primarily to incipient insulin deficiency.

It would seem that some new criteria are necessary for the normal values of the glucose tolerance test in the aged since most authors report high peaks and prolongation in the return of blood sugar to normal in a high percentage of elderly individuals who are routinely screened. For example, Chesrow and Bleyer,[8] using the oral glucose tolerance test and true blood sugars, reported that the blood sugar was not normal after two hours in approximately 50 per cent, and not normal in three hours in 22 per cent of 80 patients studied. In 26 per cent, the blood sugar rose to values from 150 to 214 mg. per cent at some period during the test; however, the majority of patients had normal fasting blood sugars. Since similar or even greater numbers of patients tested routinely have been found by other authors to have "impaired tolerance," there can be little doubt as to the accuracy of the findings. At the same time, however, it seems unlikely that this large number of patients have true diabetes mellitus.

Diabetes in adults is further characterized by obesity; approximately 86 per cent of diabetics over 40 are overweight.[2] In patients over 60, the onset is usually slow and insidious, and the degree of metabolic insufficiency is usually mild. But, as pointed out by Root and Barclay,[1] some patients may exhibit marked insulin resistance and a significant number of patients take 20 or more units of insulin per day (figure II). In their series of patients aged 70 years or older, less than six per cent of patients were controlled on diet alone. In spite of this, it is fair to say that nearly all patients who are significantly overweight will be benefited by reduction of their weight to within five per cent of their calculated ideal weight. Often these patients have few symptoms, and the process is not recognized until they present themselves for treatment of some other complication. In the elderly this will often be for complications of arteriosclerosis such as cerebral thrombosis, coronary occlusion, obstructive vascular disease in the lower extremities, failing vision, or infections. As the patient's ability to metabolize glucose is often diminished as a result of these stresses, overt symptoms such as polyphagia, polydipsia, polyuria, and

weight loss may make their first appearance at these times. As diabetic coma is less frequent in the elderly than in the young individual, other diagnostic possibilities such as cerebrovascular accidents and uremia should always be considered in addition to diabetic acidosis in the elderly comatose diabetic.

Manifestations of arteriosclerosis often produce the majority of symptoms in these patients. In a series of 59 patients reported by Goodman and Goldberg,[9] all but two had clinical evidence of arteriosclerosis. In another series of 447 diabetics 70 to 90 years of age,[1] four out of every five patients had clinical evidence of this condition. Of these, 10.7 per cent had cerebral vascular accidents and nine per cent other manifestations of cerebral arteriosclerosis, 29.5 per cent had evidence of coronary atheromatosis as shown by electrocardiograms, 3.6 per cent had angina pectoris, 7.6 per cent had myocardial infarction, and 11.4 per cent had congestive heart failure. Peripheral vascular disease with gangrene was present in 11.4 per cent and without gangrene in 10.5 per cent of patients.

Ophthalmic problems are probably next in frequency to arteriosclerotic complications. Sudden changes in refractive errors usually due to unstable diabetes, cataracts, and diabetic retinitis are most common.[10] The latter occurred in 22.6 per cent of Root and Barclay's series.[1] True diabetic cataracts are rare in the elderly, the usual senile cataract being much more common. Rarely, other ophthalmic conditions such as diplopia, rubeosis iridis diabetica, and optic neuritis may occur.[10]

Another frequent complication is diabetic neuropathy. This is more common in the elderly, 75 per cent of patients being over 40. In Root's series, 20.1 per cent had severe neuropathy and many more had mild to moderate disturbances in sensation or loss of reflexes.[1]

Treatment

The principles of good diabetic management should be followed in the older patient just as in the younger diabetic. The diet should contain approximately 1.25 gm. of protein per kilogram of body weight unless there is moderate to severe renal disease, in which case protein should be moderately restricted. Carbohydrate is given in amounts of 150 to 250 gm. and the balance of the caloric intake is derived from fat. If the total caloric intake is calculated on the basis of the patient's ideal weight, this will ordinarily provide a diet leading to reduction in weight of the obese patient.

In view of the possible relationship of dietary fats and cholesterol to the development of atheromatosis and the demonstration of certain abnormal lipoproteins in diabetics, especially in those with peripheral vascular disease,[11] a number of investigators have studied the effects of qualitatively or quantitatively altering fat intake in these patients. Kinsell and associates[12] reported substituting vegetable fats for those of animal origin. In adult outpatients, such a regimen led to reduction in cholesterol and cholesterol esters, but phospholipid levels were not significantly changed. In three juvenile diabetics studied in a metabolic ward under close supervision, serum cholesterol fell to normal in all patients and improvement of diabetic retinitis occurred. In one of the three, diabetic nephropathy improved. Lamar[13] has advocated the use of high-carbohydrate, high-fructose, and low-fat diets, with the principle fats used being high in unsaturated fatty acids. Reduction in vascular complications of diabetes was reported to occur, and, in one instance, severe generalized xanthomatoses were said to have cleared rapidly. It would seem wise, therefore, to reduce fat intake in these patients, particularly if there is any disturbance of the serum lipids or if evi-

dence of arteriosclerosis is present. The possible role of sitosterols which diminish the absorption of cholesterol from the intestinal tract needs further evaluation, but they may be used as adjunctive therapy in selected cases.

Insulin is prescribed as for younger patients. The majority can be controlled on small to moderate doses of NPH insulin (figure II). Hypoglycemic reactions are to be particularly avoided, since cerebrovascular accidents and myocardial infarction occasionally may be precipitated in such circumstances. For this reason, it may be better to allow elderly patients to have a somewhat higher blood sugar than would ordinarily be permitted in the younger diabetic. It is the thought of some investigators that these patients are better controlled by using the daily tests for urine sugar as the basis for insulin dosage. While realizing that many patients have an elevated renal threshold for sugar and, therefore, if they are controlled by this method the blood sugar will be elevated above the range which is usually considered desirable, it should be remembered that the usual cause of an elevated threshold is renal vascular disease which leads to a reduction in glomerular filtration rate. Many, if not the majority, of these patients have associated cerebrovascular disease, and, while conclusive evidence on this point is lacking, it seems entirely possible that in such circumstances somewhat elevated blood glucose levels may be necessary for adequate cerebral metabolism.

The merit of using oral hypoglycemic agents in place of insulin is still controversial. These drugs are not an oral insulin and are definitely contraindicated in any patient with ketosis or diabetic coma.[14] Other than the fact that such compounds may be given by mouth, there are as yet no known advantages as compared to insulin. In view of the facts that (1) the exact mechanism of their action is not yet known, (2) there may be chronic toxicity, and (3) the natural history of the diabetic process during treatment with these agents is not known, it would seem advisable to restrict their use to research centers and to patients in whom for one reason or another, such as blindness or paralysis, administration of insulin is impractical if not impossible.

The real therapeutic problem in the elderly diabetic is often the treatment of complications rather than the chemical control of blood sugar. Cerebral and coronary arteriosclerosis and their complications are treated as they are in nondiabetic patients. In patients with obstructive vascular disease of the arterial system supplying the lower extremities, the initial step is to perform a careful evaluation of the location, extent, and type of obstruction. It is particularly important to determine if claudication or arterial insufficiency is due to an obstructive process in the distal aorta or in its larger branches, since modern resective vascular surgery can often rehabilitate these patients. With modern surgical technics, age itself is not a contraindication and the majority of these patients can withstand such a surgical procedure surprisingly well.

Unfortunately, in the majority of diabetic patients, the vascular insufficiency is due to obstruction of the smaller arteries and arterioles, which are not amenable to surgical technics on the arterial system. In the diabetic with peripheral vascular disease, infection and gangrene are usually more frequent than intermittent claudication. This is the reverse of the situation in nondiabetic patients with obstructive arterial disease and probably is due to the more extensive occlusion of the smaller arteries and arterioles in the diabetic. While all measures often fail to lessen claudication, it is worth while to attempt to increase the circulation by administering peripheral vasodilator drugs or by lumbar sympa-

thectomy. Drug therapy should be tried, but, if significant improvement is not obtained, the patient then should be evaluated for sympathectomy. If peripheral blood flow can be evaluated before and after lumbar sympathetic block prior to the actual surgical procedure, candidates most likely to obtain the best results may be selected.

Due to differences in criteria for admitting diabetic patients to hospitals, it is difficult to determine the incidence of infection and gangrene of the extremities. McLaughlin and Heider[15] reported an incidence of 7.2 per cent in a group of 1,912 diabetics. This compares closely with the figure of 11.4 per cent in Root's series of somewhat older diabetics.[1] In the former group of patients, vascular complications occurred most frequently during the fifth, sixth, and seventh decades and particularly in patients with diabetes for five years or longer. While there was no direct correlation with the adequacy of treatment in those not previously treated and in patients in whom treatment was classified as poor or fair, it seemed significant that only nine per cent of their patients with vascular disease were classified as having good diabetic control. Penetrating ulcers occurred in 31 per cent of the 135 patients studied, dry gangrene of the toes in 20 per cent, wet gangrene of the toes in 17.7 per cent, extensive wet gangrene in 30 per cent, and extensive dry gangrene in 1.3 per cent.

In the treatment of infections of the lower extremities, prevention of infection is the method of choice. All patients should be instructed in the methods of proper foot care, selection of proper shoes, and avoidance of trauma to the feet and lower extremities. Even minor abrasions or infections should receive immediate attention. If infection becomes established, it is advisable to hospitalize the patient. Cultures are taken, and appropriate antibiotic therapy is instituted. In the interval until the results of cultures are obtained, therapy with penicillin is started. The foot should be slightly elevated, and early adequate drainage of the infected area should be done. Saline compresses may be used as indicated.

The problem of amputation must always be considered in patients with infection or gangrene of the lower extremities. Most authors are now recommending a conservative attitude to this procedure.[16, 17] In patients with infection, an attempt is made to eradicate the infection as outlined above without amputation. In cases of both infection and gangrene, the approach should be to save as much of the extremity as possible. Smith[16] suggests, "First, amputation of the toe is considered; next, the transmetatarsal procedure; then, a true guillotine operation at the lower third of the leg; and, lastly, amputation of the lower leg, preferably by a modified guillotine technic leaving at least four inches of tibia." With this approach, Smith has found that supracondylar or thigh amputations are only necessary occasionally. This is in contrast to the thinking of ten to fifteen years ago when thigh amputations were usually considered to be the method of choice.

Lumbar sympathectomy should also be considered in these patients, although it should be realized that many patients fail to obtain significant benefit from this procedure. Berry and associates[18] have stated that there is little chance of obtaining a good result from lumbar sympathectomy (1) in diabetic patients over 65 years of age with clinical evidence of arteriosclerosis in other organs or elevated systolic blood pressure; (2) when there is evidence of marked capillary anoxia and severe atrophy of the soft tissues of the leg; (3) when popliteal pulses are absent and there is severe pain in the lower leg or foot; (4) when there is obvious widespread arterial in-

volvement and a rapidly progressing process indicating arterial obstruction; and (5) when there is painful gangrene or ulceration of the foot in elderly patients with absent popliteal pulses.

Prognosis

The prognosis of diabetic patients has steadily improved. In Joslin's group,[2] the average age at death in the period from 1944 through 1951 was 64.7 years. While longevity is not yet as long as that of the general population (in 1949, 65.9 years for men and 71.5 years for women), continuation of the trend of increasing longevity observed in the past fifty years should result in a normal life expectancy for diabetics. Indeed, the group of patients recently reported by Root and Barclay[1] who had reached the age of 80 after having had diabetes for 35 to 46 years is an outstanding example of the type of results which can be obtained when both the physician and patient are thoroughly familiar with diabetes mellitus.

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Current concepts in diagnosis and management of osteoarthritis

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Much relief can be afforded the patient with osteoarthritis by attention to simple therapeutic regimens. This paper outlines the present-day management of this disease by detailing these measures and stressing the judicious use of newer steroid agents. A new method of therapy for osteoarthritis of the cervical spine is presented.

◆ Arthritis in the elderly patient, though not curable, is a treatable disease. Success of treatment depends upon the willingness of patients to accept some degree of relief of symptomatology rather than to look for a complete remission. For these patients, present-day therapy is successful for it is able to provide noticeable symptomatic improvement in most cases.

This paper will concern itself almost entirely with a clinical review of osteoarthritis—its symptomatology, diagnosis, and management. These form the bulk of problems with arthritis in the elderly patient in clinical practice. However, automatic assumption that only osteoarthritis and old age are compatible will lead to faulty diagnoses and mismanagement of the patient. One may see rheumatoid arthritis in the geriatric group on occasion, particularly when the onset of the disease occurs late in middle age, and, occasionally, rheumatoid arthritis will be complicated by osteoarthritis, a mixed form of joint involvement. Gout may also be seen in the elderly but not commonly so. The occurrence of these other entities makes caution imperative.

It seems wise to approach each elderly person as a diagnostic problem, resolving the diagnosis to osteoarthritis only on the basis of careful clinical evaluation, selected laboratory studies, and x-ray examinations. In some cases this diagnosis is reached only by excluding other entities.

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Symptomatology

Osteoarthritis, also called senile or hypertrophic arthritis, is a primary joint disease, with no systemic manifestations. By contrast, rheumatic arthritis begins with a synovial reaction and carries definite systemic findings.

The pathogenesis of the disease closely follows the aging process. Almost all individuals beyond middle age show some pathologic evidence of the disease. However, some of the changes may be brought on at an earlier age by trauma, recurrent dislocations, faulty joint alignments, and marked obesity. Changes in cartilage or articulating surfaces usually begin in the second or third decade and progress according to the use and stress on each joint.

Weightbearing seems enough to initiate the process, with blistering of cartilaginous surfaces, splitting, and pit for-

mation. The avascularity of the tissue hinders repair, and, consequently, further stress or trauma enhances the degenerative process. Eventually, erosions in the cartilage bring denuded bone into the articulating surface. This bone becomes eburnated and occasionally shows cystic changes. At the joint margins proliferation of cartilage occurs, with calcification and, eventually, overgrowth of bone. Throughout this process, the synovial membrane may show little or no involvement.

The symptomatology also follows the principle of "wear and tear." The joints affected are those which have received most of the wearing process. Knees, hips, lumbar and cervical vertebrae, and terminal interphalangeal joints are most commonly involved. Should one joint in particular be symptomatic, the physician should look for a source of obvious or continued minor trauma. Most prone to knee involvement would be a person whose work required much walking. A typist might have phalangeal involvement. A porter or tennis enthusiast might show unilateral or bilateral shoulder involvement. Most often overlooked are the factors contributing to cervical spine involvement which might affect the executive confined to a desk for much of each day, the telephone operator, or the scholar.

Symptoms vary with usage. Of the many individuals affected by this process, only a few are symptomatic. On arising in the morning, the patient may experience some pain and stiffness as a joint is put into motion for the first time in many hours. Further activity may bring relief, then, after prolonged use during the day, joint symptoms recur. As pain may dictate a decreased activity, symptoms may subside within a short time, only to recur with more active use of the joint. During sleep, symptoms are usually absent. This pattern of pain and stiffness contrasts markedly with rheumatoid arthritis, in which symptoms often occur at rest. With time, as in the elderly patient, symptoms often show no remission.

Involvement of the spine may give sensations of pain and stiffness in the involved area. In the cervical spine, radicular pain may be encountered, with radiation to the occiput, shoulder, and scapular regions, and to the upper extremity. This distribution of pain may confuse the physician by mimicking the symptoms of angina pectoris. In some cases, these symptoms may be reproduced by twisting the neck, offering a point in differential diagnosis. With lumbar spine involvement, pain radiation along the distribution of the sciatic nerve may occur. Occasionally, degeneration of the temporomandibular joint is seen. This may be associated with symptoms referable to the molar teeth or dentures.

Diagnosis

A diagnosis of osteoarthritis may be based on a number of factors:

A *history of joint symptoms* following trauma, *pain and stiffness* after exercise, or *x-ray evidence* of narrowing of joint spaces with formation of osteophytes at lateral articular margins. These findings are not present early in the disease but progress with the joint involvement to show irregularity of joint spaces, eburnation of bone, and marked marginal lipping.

With arthritis of the spine, symptoms of *pain in a nerve root distribution* are also a factor. The exact site of involvement may be confirmed by x-ray films. Most significant is involvement of the intervertebral foramina, through which the nerve roots pass. This is best shown in oblique views of the spine. Standard anteroposterior and lateral films often are of no value, other than perhaps showing ancillary involvement of marginal lipping and ligamentous calcification.

Far-advanced disease may show *ob-*

vious joint enlargement. This is especially true if significant trauma has preceded the disease. Otherwise, objective joint involvement may be absent or limited to Heberden's nodes, most commonly found on the dorsal aspect of the distal interphalangeal joints.

Laboratory studies are of no value in the diagnosis of the disease. Blood counts and sedimentation rates remain unchanged. Laboratory aids in the diagnosis of rheumatoid arthritis, as the sheep-cell agglutination test and latex agglutination reaction[1] and the bentonite flocculation test[2] are uniformly negative.

Management

Current therapy makes use of some time-honored methods and embraces the more modern concepts of steroid administration. Much benefit can be derived from a positive approach by the physician. This involves an explanation of the disease to the patient, including some consideration of etiology, role of trauma, and mode of progression. More important, it should include a detailed account of the plan of therapy, with reassurance that therapeutic measures often are successful.

DIETARY MANAGEMENT

There is no evidence at this time that specific dietary factors play a role in the pathogenesis and symptomatology of this disease, although some experimental evidence from animal studies has been forthcoming to suggest that nutritional factors may influence the resistance of cartilage to "wear and tear."[3,4] These studies have shown that the administration of a high-protein or high-fat diet may alter the rate of appearance and severity of osteoarthritic changes in a strain of mice. The application of these findings to therapeutic dietary measures in human beings seems remote, without further experimental evidence. Robinson,[5] in a review of the relationship of nutrition to joint disease, concluded that present-day knowledge has not implicated a specific dietary factor in this disease.

Nevertheless, dietary measures constitute an important therapeutic factor in osteoarthritis. Many patients are overweight. Since osteoarthritis occurs most commonly in the weightbearing joints, the introduction of a reduction diet often provides an important aid to the relief of symptoms. Weight reduction may not only provide symptomatic relief but slow the degenerative processes in the articular cartilage.

PHYSICAL THERAPY

Dietary management may not be sufficient to provide maximum symptomatic relief in many cases. Certainly, the period of weight reduction may be a prolonged one. To this therapeutic measure we may add elements of physical therapy. During symptomatic periods, exercises may be helpful but should not be vigorous to the point of inducting further trauma. This dictates the necessity of passive exercises rather than activity involving further weightbearing. A trained therapist may be of great benefit in directing planned exercises. Included in this regimen may be cool and warm contrast baths, especially for joints which are markedly painful and stiff, and gentle massage of adjacent muscle groups also may be beneficial. The use of braces and splints is not necessary unless repeated trauma has produced an abnormal range of motion and joint unsteadiness.

SALICYLATE DOSAGE

The usual therapeutic doses of salicylates should be included in any regimen for the treatment of symptomatic osteoarthritis. In many cases, a dosage of 600 mg. every four hours will be effective in providing some symptomatic relief. A number of cases may be maintained on dietary restriction and salicylates alone.

Oral. The administration of steroids by this route in the treatment of rheumatoid arthritis has been shown to be ineffective. Some symptomatic relief may be attained by the use of large doses, but the chronicity of this disease and the complications of long-range high-dosage steroid administration make this form of therapy inadvisable.

Intra-articular. The concept of intra-articular injection of steroids has won a place in the therapeutic regimen for osteoarthritis. Initial studies with hydrocortisone acetate[6] and cortisone acetate[7] suspensions proved them to be quite effective in two series. Later, suspensions of prednisone acetate and prednisolone acetate were shown to be effective.

The mechanism of action of intra-articular steroids is not clearly understood. It has been shown that steroid injected into a knee joint diffuses rapidly through the synovial membrane into the systemic circulation. Within a very short time, the concentration of steroid is equal in the opposite knee joint. Administration as an acetate suspension does serve to slow the rate of absorption. It seems most likely that anti-inflammatory action is exerted by the steroid at the site of the articulation. At least, the symptomatic response is far greater than has been produced in this disease by comparable doses given systemically.

Trauma is important in the pathogenesis of this disease and the production of symptoms. With trauma is associated inflammation of synovial membranes and surrounding tissues, and a great increase in joint fluid may be seen. In such a joint, it seems reasonable that anti-inflammatory agents may be significant in the reduction of inflammation and the eventual subsidence of pain, swelling, and stiffness. This has been the pattern of response in most large series of cases.

Most involved joints may be approached intra-articularly. The most accessible are the ankle, knee, elbow, shoulder, and wrist. The hip joint, by the nature of the location of the acetabulum is not as readily accessible, but we have used both an anterior and a lateral approach and have found both to be successful when carried out by an experienced physician. Finger joints also are accessible from a dorsal approach, using smaller bore needles and smaller volumes of injection fluid.

Syringes and needles used in injections should be autoclaved. It is apparent from thousands of injections at the Philadelphia General Hospital and Hahnemann Hospital that this procedure is vital, since joint suppuration from injections has not occurred. This has not been the experience of other clinics using water sterilized syringes and needles, although the incidence of joint infections has been low. Most joints may be approached with a No. 21 gauge, 1½-in. needle. For finger joints, a No. 22 or 23 gauge ½-in. needle is more satisfactory. For hip injections, spinal length needles are required. We recommend that the initial dose of hydrocortisone acetate or cortisone acetate should be 25 or 50 mg. With acetate suspensions of prednisone or prednisolone, the dose should be 12.5 or 25 mg. Little difference in clinical response has been noted between these preparations, although the latter two have a reduced volume of injection fluid. To this solution in the syringe should be added an equal volume of 1 per cent procaine hydrochloride. This serves two purposes, it provides some immediate symptomatic relief, since steroid suspensions often show a lag period of twelve to twenty-four hours before providing a response, and it alleviates symptoms of pain and swelling occasionally encountered within the twenty-four hours following an intra-articular steroid injection. The procaine-steroid mixture is injected into the joint after it has been determined that a blood vessel has not been entered.

The pattern of response varies with the individual patient. Most patients receive relief for a few days from the initial injection. With repeated weekly injections, the period of relief of symptoms tends to increase. With continued therapy, injections may be given at progressively longer intervals. Studies with patients serving as their own controls and receiving a placebo or procaine hydrochloride alone show that the presence of the steroid is necessary to provide symptomatic relief for more than twenty-four hours. This is an important consideration, since the psychological factors of the patient-physician relationship are most important in the treatment of arthritis. It is well known that a "positive" approach in therapy, regardless of the agent utilized, means much to the symptomatic response in some patients. Perhaps this is illustrated by the dramatic response of an occasional patient to a single steroid injection, with no further therapy required for several months. The majority of patients, however, fall into the group receiving benefits initially for short periods. A smaller number require injections initially at two to three week intervals. All investigators have reported therapeutic failures in a small percentage of cases.

Caution in this procedure is dictated by a number of considerations—the possibility of introduction of bacteria into a joint, the risk of accidental intravenous or intra-arterial injection, or the injection of steroid into a tuberculous joint. As noted above, the first consideration demands that syringes and needles be autoclaved. Further care requires a careful cleansing of the skin prior to the injection. If applied vigorously, 70 per cent alcohol is adequate. The latter note of caution suggests that an accurate diagnosis is imperative prior to institution of intra-articular therapy.

Paravertebral. This is a new method of treatment recently proposed for osteoarthritis of the cervical spine.[7,8] Arthritis of this type is one of the most difficult to treat. In the past, the time-honored methods employing traction and neck collars were most often relied upon. Both of these are cumbersome and often provide relief for only short periods of time.

A locally injected steroid suspension in the cervical spine area cannot be intra-articular, since the articulations of the facets are not readily accessible to a needle, and most neck areas are replete with important blood vessels and nerves. Posteriorly, the spinal canal may be entered, making it necessary to deposit steroids either near articular surfaces and intervertebral foramina or paravertebrally.

To consider that steroids may be effective in this manner is not an attractive hypothesis. Not only is it difficult to deposit these agents near the intervertebral foramina, but also bony spurs may be present, which are not influenced by even prolonged steroid injections. However, when it is considered that pain in this area often is due to repeated minor trauma in a most articulate region with inflammation of the soft tissues adjacent to the bony spurs and emerging nerve roots, use of anti-inflammatory agents seems more reasonable. In all likelihood, the mechanism of action is similar to that in a large joint, with the exception that nerve impingement is prominent in the cervical area and makes some form of symptomatic relief imperative.

In determining the injection site, the following criteria may be used:

(1) The presence of radicular-type pain, distributed to the shoulder girdle, upper extremity, or occiput; accentuated by motion and activity; relieved by rest. With knowledge of the cervical and brachial plexuses of nerves, this may pinpoint the level of the arthritic process producing the symptomatology.

(2) Oblique roentgenograms of the cervical spine showing bony changes in

FIG. I. *Oblique view of cervical spine with normal contour of neural foramina.*

FIG. II. *Oblique view of cervical spine showing minimal osteoarthritis, with spur formation in foramina.*

FIG. III. *Oblique view of cervical spine showing advanced osteoarthritis, with involvement of the areas of nerve root passage.*

the intervertebral foramina (figures I, II, III).

The technic of injection is rather simple.[7,8] The skin is cleansed and sterilized with 70 per cent alcohol applied vigorously, and the mixture of steroid acetate suspension and 1 per cent procaine hydrochloride, in equal volumes, is drawn into a small syringe fitted with a 1½-in. No. 21 gauge needle. With the patient sitting upright in a chair, the level of injection is selected according to the above criteria, and the needle is inserted midway between the posterior and lateral midlines of the neck. For midcervical levels, this is just posterior to the dorsal border of the sternocleidomastoid muscle. The needle is advanced medially and anteriorly at an angle of 45° until the transverse process is encountered. The plunger of the syringe is withdrawn to ensure that a blood vessel has not been entered and

the procaine-steroid suspension forcefully infiltrated into the area.

With the technic described, the needle is not advanced into a foramen. To do so might be injurious to a nerve and require introduction of the needle more anteriorly, through an area rich in major blood vessels and nerves. Utilization of the posterolateral approach entails passage of the needle through an area relatively devoid of major vessels and nerves, yet sufficiently lateral to avoid entrance into the spinal canal.

This approach has proved to be safe, as evidenced by our lack of complications in more than 1,000 injections. On only three occasions has a blood vessel been entered prior to injection, each time without sequelae. The force of the injection carries the suspension to the area of emergence of the nerve. This has been well demonstrated by x-ray studies, utilizing contrast material for injection.

Using this procedure, symptomatic relief has been produced in a majority of patients. Initially, hydrocortisone acetate and cortisone acetate were used. More recently, we have relied on prednisone or prednisolone acetate suspensions. In most cases, the relief of pain has not been dramatic with the first injection but has become significant after a few injections. A number of patients have attained relief without the use of traction devices or collars, and, in some cases, we have removed patients from these devices and made their use unnecessary. The usual pattern has been to repeat injections at weekly intervals until progressively fewer injections are required to maintain the patient asymptomatic.

Recognition of the psychologic factors in the treatment of osteoarthritis applies particularly to the treatment of cervical spine involvement. It seems probable that a positive form of therapy, such as an injection through the neck region, may have contributed to the dramatic response of a few patients who responded completely to only one or two injections. Control studies with 1 per cent procaine hydrochloride alone, however, have shown that the act of injection itself does not produce the degree of symptomatic improvement attained with procaine-steroid suspensions.[9] Relief from procaine hydrochloride alone rarely lasts beyond twenty-four hours.

The lack of successful response in some patients may depend upon several factors—the psychologic makeup of the patient, a far-advanced stage of the disease, repeated trauma, and faulty placement of injections. Also, these cases should be viewed with a differential diagnosis in mind, since a cervical-disk syndrome often masquerades as cervical osteoarthritis. Only repeated evaluations will rule out this mechanical factor.

Similar injections have been carried out in the lumbar and thoracic regions, but these areas have not been studied as extensively with this technic. Some success has been reported in a few cases with cortisone acetate suspensions, but the anatomical configuration of the articulations makes passage of a needle into the spinal canal a greater possibility.

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The principles of sound nutrition in the aged

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Because old people are often on the borderline of nutritional deficiencies, and because aging is hastened by degenerative changes, nutrition of the aged becomes a prophylactic and therapeutic project. Fewer calories, an increased intake of protein, a reduced intake of fat, a good supply of vitamins and minerals, and a water intake to insure an adequate urinary output are the essentials.

◆ Since the dominant problem of the aging is the maintenance of good health, the nutrition of this group is a fundamental prophylactic and therapeutic project. The principles of nutrition in the aged vary little from those of the population as a whole.[1] However, the aging process, being one of decreasing reserves, brings with it anatomic and physiologic changes which are modified by factors of disease, trauma, heritage, social adjustment, and economy.

Despite this, the internal environment constants are fairly well maintained in the aging. Temperature, pulse, fasting blood sugar, urea, calcium, and many other constants are maintained at the levels found in childhood or maturity.[2] Elderly individuals, free of edema, have approximately the same blood volume per unit of body weight.[3] Acid-base balance does not change, even in men 90 years of age.[4] Fasting arterial blood sugar is not affected by age.[5] Old and young patients do not have a significant difference in eosinophil response to ACTH administration.[2] On augmented protein intake, elderly males are just as able to retain nitrogen as the young.[2]

These examples of body constants, therefore, would tend to imply no functional changes. Yet, the facts are not all as reflected by body constants, for changes do take place. Once growth has ceased, a persistent degenerative change occurs: cells lose their ability to exist; cell membrane is altered; and the cell interior can no longer maintain certain concentrations. Gradual tissue desiccation, slowing of cell division, cell growth and tissue repair, and cellular atrophy and degeneration continue in the absence of any proved gross disease, until the tissues are no longer capable of maintaining homeostatic mechanisms and death of the organism ensues.[6]

These anatomic changes at the cellular level are reflected in functional disturbances, however subtle. For example, the fasting blood sugar of arterial blood is normal. However, in the aged the intravenous glucose tolerance test shows that the postingestion glucose level tends to return to the resting level more slowly, with progressive increase in time with increasing age. Thus, there is an impairment of glucose tolerance in the aged.[5]

By the same token, although nitrogen retention is not manifested in the healthy

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aged who are free of renal disease, the renal plasma flow, glomerular filtration rate, and maximal tubular excretory capacity gradually diminish with age.[7] Miller carried out experiments to test the response of the kidney tubules to antidiuretic hormone.[8] In the young there was a prompt and marked inhibition of diuresis when Pitressin was administered, but in the aged the effect was greatly diminished. Thus, with increasing age, there is progressive loss of ability of renal tubules to perform osmotic work.

Numerous studies have shown that there is a gradual diminution of basal oxygen consumption or heat production per unit of surface area as age increases.[6]

Aging is accompanied by progressive reduction of lean body mass, due primarily to loss of muscle mass. This represents an extensive loss of body protein and is associated with depletion of water. Relative, or even increase in fat content of the body occurs,[9] which may be due to deficient intake of protein. Poor motivation for preparing food, decrease in appetite for protein, diminishing sensitivity of taste and smell, and poorly fitting dentures are all factors underlying reduced intake of protein food. Volume and acidity of gastric secretions are reduced.[10] In a group of 664 subjects who received histamine stimulation, achlorhydria occurred in 27 per cent in the 60-to-69 group.[11] Enzymes in the gastrointestinal tract decrease in amount and achlorhydria is common. These may interfere with digestion and absorption of protein. Liver function is altered with advancing age,[12,13] and there seems to be a relative and absolute decrease in albumin content of serum. All globulin fractions increase, which may indicate a diminished rate of synthesis by decreasing liver function, or may reflect a deficiency of protein intake and decreased gonadal secretion.

There is a diminishing resting cardiac output with increasing age.[14]

B_{12} content of serum of normal individuals tends to decrease and B_{12} absorption is diminished in the aged.[15] Ascorbic acid levels and thiamin levels tend to be low in the aged. Inadequate vitamin intake is probably a major factor,[16] yet vitamin A levels following administration of the vitamin indicate that it is absorbed equally well in persons 60 to 90 years of age. Age does not seem to be an important factor in determining vitamin absorption.[17] Obviously it is impossible to review all of the changes consequent to aging, but they have been well documented.[18]

In addition to the functional change of anatomic structures, there are certain social and economic factors which have to be evaluated and considered in the aging. Retirement, loneliness, changes of living arrangements, reduction of income, loss of teeth, lack of adequate dentures, waning appetite because of decreasing acuteness of the senses, lack of cooking facilities—all serve to alter the dietary habits of the aging.[19,20] Moreover, the habits of the aged may be an obstacle to good nutrition. It is wise to consider that abrupt changes are not tolerated well in the aged, whether it be change of domicile or diet. Experience has taught them what they can tolerate.

Nutritional Requirements

Nutritional requirements consist of the basic food substances, water, salts, protein, carbohydrate, fat, and vitamins.

WATER

Water must be considered as a nutritional element, for all of the physiologic functions of life occur in a milieu of water. The type of food eaten influences water requirements. Carbohydrate yields water on being burned and therefore will lessen the water requirement, whereas fat, which does not yield water, will increase it. Protein produces urea, each gram of which requires 20 grams of water

for its excretion in the urine. Concentration of salt in the food will also affect the water requirements. Kidney function, and particularly its concentrating ability, has a conserving effect on the need for water. For any total output of substances by the kidney, a quantity of water is required for their removal. In the aging person, because of failing tubular work against osmolarity, the minimal excretory volume for concentrating power is higher than in a younger person, and amounts to 700 to 1000 cc.[21] To this must be added insensible loss of perspiration (300 to 600 cc.) and the respiratory loss of water by vaporization (about 400 cc.). This totals 2,000 cc. It is advisable, however, to so increase water intake that the urine output is at least 1,500 cc. per twenty-four hours. Water per se may be not too well received. It is wise to incorporate, into the intake of water, any other form of liquid such as tea, coffee, milk, soups, fruits, juices, gingerale, and even beer.

TOTAL CALORIC REQUIREMENTS

The most obvious nutritional defect to be corrected in the aged is caloric imbalance. The extremes of obesity and emaciation are equally devastating. Overnutrition hastens development of pathologic change and undernutrition lessens an old person's vigor and sense of well-being. Body weight is the best guide to adequate caloric intake. Maintenance of a weight-height relationship approximate to those given in the readily available reference tables is to be encouraged.[22] The metabolic activity of the body consists of all the various chemical reactions responsible for growth, maintenance of vital functions, and energy production. Ingested food provides the energy for these various processes. There is a definite relationship between energy of intake and that of output and storage.[23] Obesity is almost invariably caused by an excess of caloric intake.[24]

Older persons suffering from involvement of locomotion mechanisms, hemiplegia, arthritis, multiple sclerosis, parkinsonism, and cardiac disease often seek gratification in food.[25] Because of unwillingness to prepare food, diminishing interest in protein food, lack of dentures or insufficient funds to buy them, a lack of cooking facilities, older people tend to eat increasing quantities of carbohydrates.

Obesity is detrimental. As mortality statistics have shown, the obese are more susceptible to the serious degenerative diseases. Prognosis for the cardiac or the diabetic patient is considerably poorer when obesity is a complication.[26]

Gradual weight reduction by an enforced schedule of caloric restriction is essential to good nutrition of the aged. Education, encouragement, and, at times, the use of anorexic drugs may be necessary. Decreased physical activity, decreased heat production, and change in body size lessen the need for caloric intake in the aged. Body weight may be maintained on an average of 1,500 calories for the elderly woman and 2,000 for the elderly man.[27]

Hypertension develops twice as fast in the obese as in the person of normal weight. The degenerative diseases of the heart, blood vessels, and kidneys are responsible for most of the greater mortality in the obese. Master showed that, by restricting caloric intake with weight reduction in obese subjects, there resulted an average drop of 16 per cent in oxygen consumption, an increase of 24 per cent in A-V O_2 difference, a difference of 30 per cent in cardiac work, slowing of pulse rate, and lowering of blood pressure.[28]

An A-V oxygen difference is a manifestation of improved oxygen utilization. Cardiac work is therefore reduced. An associated effect is an increased vital capacity. Parallel to this work is the report of Kroger and Magendantz who, by dietary restrictions, produced a slowing

of the heart rate, decrease in systolic and diastolic blood pressures, increase in vital capacity, decreased respiratory rate, decreased oxygen consumption, decreased cardiac work, and smaller heart size in congestive failure patients.[29] Keys showed reduction in heart size that was relatively comparable to the loss of body weight in people with undernutrition.[30] Loss of epicardial fat was most striking. In accord with this reasoning Monat suggests that a good caloric diet for the aged cardiac patient is 1200 calories (20 calories per kilogram of ideal body weight).[31] The formula he suggests is 60 grams of protein, 30 grams of fat, and 172.5 grams of carbohydrate. The daily allotment of fluid is 2,000 to 3,000 cc. Calcium and vitamins are added.

Other workers have noted the beneficial effects of low calorie intakes. From a three-year survey, Vallejo reports the incidence of cardiovascular disease, congestive cardiac insufficiency, and diabetes to be twice as high for persons in a control group as in a group of persons who, on alternate days, received 2,300 calories (50 grams of protein, 40 grams of fat, and the remainder made up of carbohydrates) and on the other days received one liter of milk and 500 grams of fresh fruit.[32] This group maintained a feeling of well-being in contrast to the control group, with twice as many sick calls.

Every clinician has found that reduction of body weight to within or slightly below normal limits is an important factor in the regulation of diabetes. In fact, loss of weight often leads to a disappearance of hyperglycemia and glycosuria.[33]

PROTEIN REQUIREMENTS

Caloric restriction does not interfere with nitrogen balance. Protein repletion can occur despite caloric restriction, the energy requirement being satisfied by endogenous fat sources.[34]

The normal dietary requirement of protein is accepted as one gram per kilo of body weight.[35] Experimental evidence shows that the body may assimilate as much as 10 grams protein per kilo per day.[36] Because of the apparently decreased needs for tissue-building material in the aged, low protein diets have been suggested.[37] It is now recognized, however, that there is a constant need for protein because of constant destruction and loss of body proteins.[38]

Negative nitrogen balance is very common in the aged. Kountz and Hofstatter found that the greater percentage of their selected aged failed to maintain nitrogen balance on 1 to 1.2, and even 2 grams per kilo of body weight.[39] Poor absorption may have been a factor, for they were able to find increased nitrogen in the stools. They noted that their patients had poor food habits, making poor selections from their food trays.

A desirable objective is 1 to 2 grams or more of proteins per kilogram of body weight in the form of lean meat, lean fish, fowl, milk, cheese, and the white of egg. Hydrolyzed or predigested proteins, in the form of amino acids or polypeptides added to milk or water or to soups or cereals, are a very acceptable and digestible method of protein supplementation. The entire protein part tof the diet may be supplied by these hydrolysates. When sugars, vitamins, and iron are added, life may be completely sustained by such mixtures.[36]

Chronic protein deficiency is to be guarded against because of its profound effects when anabolic processes are in the ascendency. Loss of weight, lassitude, asthenia, nutritional edema, faulty wound healing, lowered resistance to infection, impaired hepatic function, secondary anemia, and, finally, extreme malnutrition ending in death follow such protein impoverishment.[40]

FAT REQUIREMENTS

The controversy over the significance of

fat in the diet, the level of plasma cholesterol and lipids, and their relationship to atherosclerosis is still unsettled. The controversy, however, has called attention to the role of fat in the diet.

Epidemiologic studies suggest that where there is a higher and persistent level of cholesterol in the blood, there is a tendency to early and severe atherosclerosis. Where there is severe atherosclerosis, there is a high incidence of coronary heart disease.[41, 42] Others have found that the total caloric intake, if excessive enough to produce obesity, is a more important factor in production of atherosclerosis.[43] Gofman has shown that persons with coronary artery disease almost invariably show the presence of abnormally large, low-density lipoprotein particles in the blood.[44] What was even more important was the demonstration that the restriction of fat intake is effective in lowering the concentration of these abnormal particles. The experimental reproduction of atherosclerosis in the laboratory animal has been accomplished by high-fat and high-cholesterol feedings.[45]

There are many indications, therefore, that the most valuable attack at this moment against the atherosclerotic process is the dietary approach, through limitation of total fat intake.[46] This does not seem to be the whole solution, for individual responses to diet may differ greatly. Page studied the lipoprotein and total cholesterol level responses to a variety of dietary overloads with cholesterol and fat foods.[45] The lipids moved up and down, or not at all, with some parallelism in some persons and none in others.

In animals, too drastic a reduction of fat with substitution of carbohydrates for the caloric source ultimately led to fatty degeneration of liver and kidneys.[45] This may possibly have been caused by loss of essential fatty acids. Certain fatty acids —linoleic acid, linolenic acid, and arachidonic acid—are essential for they cannot be produced de novo in the tissues. The first two are found in vegetable oils and the last in animal fat.

Some workers believe that essential fatty acids are necessary for the transport and the metabolism of cholesterol, and for the transport of fat soluble vitamins.[47] Other workers feel that the total fat content in the diet, rather than the cholesterol concentration of the food in the diet, is the more important factor in producing atheroma.

Keys and associates studied the relationships of saturated and unsaturated fatty acids, and high- and low-fat calorie percentages in diets of various groups of people.[48] They studied the incidence of coronary artery disease of the Japanese in Japan where coronary heart disease is rare; in Hawaii, where it is common; and in California, where the local Japanese have a frequency similar to the Caucasians about them. These differences paralleled the levels of beta lipoprotein cholesterol as well as the percentage fat calories in their diets. The Japanese in Japan ate a diet containing about 10 per cent fat calories, while the Japanese in California and Hawaii ate an average of 39 per cent fat calories, much of it of animal fat origin. They concluded that these findings are consistent with the general deduction that atherosclerosis is proportional to the percentage of calories in the diet provided by fat, particularly by the saturated fats of animal origin.

Weight loss will reduce serum lipoproteins and cholesterol if they were initially elevated.[49] A corollary to the above statement is that rapid weight gain, even on low-fat and low-cholesterol diet is accompanied by an increased level of serum lipids. Serum lipids, therefore, are related to caloric balance of the body. It has been shown that men consuming high-fat diets are able to double caloric intake without increasing levels of serum lipids so long as the excess energy is ex-

pended by exercise. Muscular exercise is therefore a favorable factor in the regulation of serum lipids. People on vegetarian diets tend to have low and almost constant cholesterol levels. Less fat in the diet is associated with leanness, characteristic of a group of Central Americans studied by Mann and co-workers.[50]

In the laboratory, the life span of the rat is reduced when it is fed on high fat diets. On 5 per cent fat diets, 11 per cent of a rat colony died in five hundred days. On a 30 per fat diet, 36 per cent of a rat colony died in five hundred days, all of the factors being kept constant.[51]

We are led to the obvious conclusion that fats are essential to the body diet. It is also obvious that a smaller proportion of calories is to be contributed by fat. The optimum level of fat in the diet, as suggested by the food and nutrition board of the National Research Council, is on the order of 20 to 25 per cent of total calories. This, for an intake of 1,500 calories is roughly 35 to 40 grams of fat per day. Morrison used a diet low in fat (25 to 50 grams of fat), low in cholesterol, moderately high in protein, and supplemented with vitamin B complex.[52] In a group of 50 patients followed for eight years, there was a 100 per cent greater survival rate than in a controlled group.

CARBOHYDRATE REQUIREMENTS

Cereals, fruits, and vegetables are natural foods high in carbohydrates. The average American dietary is about 50 to 60 per cent carbohydrate. Because highly refined grains and sugars lose most of the protective elements in the refinement process, a diet high in carbohydrate of that type will be poor in essential amino acids, vitamins, and minerals.[53] Carbohydrate is the chief fuel of muscular activity, the source of cardiac muscle energy, and is the chief source of energy for brain-cell metabolism. Depletion of glycogen stores is accompanied by breakdown of protein depots, producing a negative nitrogen balance. It will also produce breakdown of body fat, with the resulting formation of keton bodies. Carbohydrates then serve as a protein-sparing and antiketogenic agent.

The supply of carbohydrates must be large enough to provide all calories necessary to maintain body weight above those calories to be supplied by proteins sufficient to maintain protein needs and fat sufficient to supply essential fatty acids and fat-soluble vitamins transport.

In apparently normal aging individuals, there is a tendency toward low blood levels of thiamin chloride and ascorbic acid, and toward an increase of porphyrinuria, which disappears upon administration of nicotinic acid.[54] The aged may require an extra quantity of B complex because their diet has a higher carbohydrate content. Factors which are possibly responsible for the tendency toward low levels and low excretions are inadequate intake of food, diets lacking in specific vitamins, poor absorption of vitamins, and failure to store adequate amounts of vitamins. Although we seldom find the characteristic picture of deficiency in the older person, we do find the more subtle and preclinical stages of deficiency. The role of these food accessories in normal nutrition is a matter of record.[40] Vitamin supplements or, in severe deficiency, the parenteral injection of vitamins should be part of any well-planned nutritional regime for the aged.

MINERAL REQUIREMENTS

Mineral requirements are not diminished because of age. Iron and calcium are most apt to be deficient in the older age group.[1] Increasing incidence of achlorhydria is often associated with chronic iron-deficiency anemia.[55] The average iron requirement in the adult is about 15 mg. each twenty-four hours. This requirement is easily met by a good protein intake.

The need for calcium is greater in the aging person than in the mature adult. At one time, the high incidence of osteoporosis and fractures in the elderly was blamed on low calcium intake, but osteoporosis is now believed to be the result of faulty metabolism of the protein-rich bone matrix, and calcium metabolism is not primarily involved.[56] Elderly people tend to lose body calcium, a loss which can be prevented by feeding high levels of calcium. Milk, cheese, ice cream, green vegetables, and the legumes are the major sources of natural calcium.

Tea, coffee, and alcohol need a word of discussion. The mild stimulating effects of caffeine are not harmful. Alcohol has proved merit as a vasodilating substance, as a stimulant for the appetite, and as a relaxing agent. Moderate and judicious use of whiskey or other alcoholic beverages is advised in the nutritional care of the aged.

Conclusions

Sound nutrition in the elderly differs only slightly from that of the younger adults. The essential principles are as follows:

- Fewer calories. The total caloric intake should be sufficient to maintain a slightly suboptimal level of body weight according to the statistical tables for height and age. If obesity is present, weight reduction is essential.

- Increased intake of proteins. An average of 2 grams or sometimes more of proteins per kilo of body weight appears to be necessary to maintain adequate nitrogen balance.

- Reduced intake of fats. Roughly 20 per cent of the total caloric intake should come from fat.

- Sufficient carbohydrates to provide the rest of the required calories.

- Sufficient vitamins and minerals, particularly iron and calcium, to correct deficiencies and maintain normal balance.

- Sufficient water intake to allow a urinary output of at least 1,500 cc. per twenty-four hours.

- Individual selection of foods. Upsetting old habits may be physically harmful and emotionally disturbing.

- Adequate replacements of necessary elements. Because the aged are so often on the borderline of nutritional deficiency of various kinds, it is imperative to insure adequate replacements, lest stress, such as illness or trauma, precipitate rapid depletion with disastrous results.[57]

- Physical activity. Activity should be encouraged, for it stimulates peripheral circulation, improves muscular tone, and promotes appetite.

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SYMPOSIUM CONTINUED IN JUNE ISSUE

The three papers omitted here because of space limitations will be found in the next issue of *Geriatrics*.

Editorial

The Hartford home-care plan

WALTER C. ALVAREZ, M.D.

GERONTOLOGISTS will be interested in the Hartford Home-Care Plan, a project based on the cooperation of the community's medical and social agencies. It is now in its second year, and is rendering a wide range of services to physicians and the public. Even more extensive benefits are planned for the future. The scheme is not an extension of a hospital service, such as we have described in this journal before; it is sponsored and financed and operated by the community and is helped by organized medicine.

The Plan began in 1954, when Dr. Alfred L. Burgdorf, the director of health, began discussing the project that he envisaged. His idea was to get the voluntary agencies in the community to support a home service for patients who were chronically ill, or slowly dying of some disease, or slowly convalescing from some disease. His idea was to help physicians by supplying a number of therapeutic skills which, in the past, they had been unable to get for their patients.

The troubles most commonly dealt with have been heart disease, strokes, certain neurologic diseases including polio, speech disorders, orthopedic diseases, and many long-term illnesses.

What the Plan supplies to the patients is home nursing; health supervision; speech training; physical therapy; occupational therapy; home-maker services; social services; and the loan of hospital beds, wheelchairs and other such helps.

The special workers send a progress report to the physician at regular intervals. As soon as the patient can get up and out of his home, another type of agency takes over. For instance, there is the Hartford Rehabilitation Center, which can help greatly.

The Home-Care Plan is likely to become more and more used as physicians discover the advantages of getting its help. Constant efforts will be made to keep patients on an ambulatory basis, so as to avoid all but absolutely necessary hospital expenses. It is to be hoped that laboratory services can be added soon, for these can greatly help the physician and the patient.

The idea is such a logical one that, before long, it will probably be adopted all over the country. Every physician of any experience knows how hopeless it is to do anything for an old person with a chronic illness simply by calling on him and leaving a prescription.

Some new thoughts on the care of the aged

WALTER C. ALVAREZ, M.D.

A SHORT TIME AGO, the Journal of the American Medical Association carried an interesting special article on some of the problems of aging.[1] Remarkable was the action of Peter V. Ortiz of Anaheim, California, who at 106 opened a bank account to start saving for his old age! Another youngster named Bert Rhoads celebrated his eighty-fifth birthday by walking up and down the 898 steps of the Washington Monument. Another man of 95, although crippled and receiving only $85 a month, gave $25 to the Torch Fund saying, "I want the kids to have it."

Recently David B. Allman, president of the A.M.A., said that the most important problem facing the medical profession today is the care of the aged. Improved medicine is largely responsible for the increasing number of people living over age 65, so we must now solve the medical problems and help solve the economic problems which have resulted.

In California, the Alameda-Contra-Costa County Medical Association doctors have a good idea. They are setting up classes for relatives of disabled elderly patients and training them to take care of the invalid at home. This can save the family and the state large sums of money. The Philadelphia County Medical Society has organized a group of "Gericrafters"—oldsters who are working with the doctors to develop skills in several crafts. In New York City mental health programs are being organized for men and women in their 80's who are encouraged to do such things as playing in orchestras, studying algebra, and painting pictures.

With the help of its several Councils, the A.M.A. is organizing many activities that will help aged people. For instance, the Council on Rural Health is combining with 4H clubs and other such groups which will now use the wisdom and knowledge of retired farmers and ranchers in helping old people who are trying to cultivate a plot of ground.

Another A.M.A. committee is studying efforts to rehabilitate the disabled elderly. There is also the special AMA committee on aging, headed by Dr. Henry B. Mulholland, which is trying to get more physicians to assume leadership in communities in which there is a desire to enrich the lives of the older citizens.

In California there are at least 70 communities in which different groups of citizens are actively engaged in helping older persons. Universities also are getting into the game. At the University of Michigan several diverse organizations have met in annual conferences on aging. The Michigan State Medical Society is looking into the problem of the great increase of free time which has come to so many elderly persons.

In Philadelphia people are looking into the question of better food for the aged. As a result they feel there will be fewer readmissions to the Philadelphia general hospitals.

The United States Public Health Service and the Bureau of the Census recently had people out ringing door bells to find out just what the problems of the

aged are. During 1957 session of Congress, there were 59 bills introduced bearing directly or indirectly on problems of being made for a Federal Bureau of Older Persons. It looks as if in 1958 there will be a flood of such legislation. The politicians are waking up to the fact that 25 per cent or more of their constituents are over 65 years of age.

Possibly some day the burden of taxation will be eased on persons past 65 or 70 years of age. At present the tax assessors can be pretty rough on a man over 70 who has the temerity to work hard and try to support himself and his wife in comfort. It does not seem to occur yet to the tax assessor that an old person who, by his great efforts sees to it that no one has to support him and his wife, is a good citizen who deserves a pat on the back rather than a peremptory demand for more tax money. Perhaps some day Congress will make an effort to help the man who finds it impossible to live on social security payments of $66 a month and who cannot live very well on the $100 a month, which he may have succeeded in earning, when his $66 is taken away from him as a reward for his efforts.

Very interesting is the fact that a number of the pharmaceutical houses are now engaged in special research for drugs that will help the aged. Surgeon General Burney has now assigned much money to help universities and other institutions with their programs for research into the causes of arteriosclerosis. The Menorah Home and Hospital for the Aged and the Infirm in Brooklyn has what is reported to be the only psychiatric clinic in the nation devoted exclusively to the problems of the aged. Dr. Tom Spies of Birmingham reports that by giving 900 feeble persons better food he was able to get them back to work.

In San Francisco, the Jewish Family Service Agency has an experimental housing project for older persons where they will be charged a low rent and given one hot meal a day. There is a similar project in New York City. The Milner Hotels Management Company of Detroit has announced that two million dollars will be spent to convert at least 25 hotels into a chain of residences for the aged. In these residences emphasis will be on supplying medical attention, food, and entertainment.

Another current problem is the devising of better psychologic tests for old people. Most of the battery of tests now available are designed for testing children, soldiers, and other young people.

Obviously one of the most important things that we need to know about an old person is the status of his mental health. Could he work? Could he get along with other people? Is his judgment good? Is his temper good enough? Or is he too irascible to get along with others?

To me, one of the most hopeful things in the country is that for the past decade, the faculty of the Hastings College of Law at the University of California has been made up of men over 65 years of age. Today the average age is 73. We need more colleges like this. Probably in many high schools and colleges old people could well be used as teachers. Certainly all over the country we are sadly in need of good teachers.

Senator Thomas E. Desmond, the devoted New York expert on problems of the aging, says so well that no one group or organization will solve the problems of the aged. Many groups working together will have to tackle these problems.

REFERENCE

1. J.A.M.A. 164: 1477-1481, 1957.

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Book Reviews

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The Neurologic and Psychiatric Aspects of the Disorders of Aging

JOSEPH E. MOORE, M.D., H. HOUSTON MERRITT, M.D., and ROLLO J. MASSELINK, M.D., editors, 1956. Proceedings of the Association for Research in Nervous and Medical Disease. Volume 25. Baltimore: Williams & Wilkins Company. 307 pages. $8.50.

This book contains the papers and the discussions that were given at the annual meeting of the Association on December 9 and 10, 1955, in New York City. Fourteen chapters each represent a paper by a person generally recognized as an authority in his special field. A fifteenth chapter reports a panel discussion in which seven persons participated.

It is difficult to review a volume by so many different authors or to pick out for special discussion any particular chapters, all of which deal with the subject in excellent fashion. In addition, the contributions of the discussants are on a par with the papers themselves. One can say, therefore, that this book brings the reader up to date on some of the most recent and authoritative thinking regarding these various topics. With the reviewer's prerogative, I have selected a few chapters for comment.

In Chapter 1, Biology of Aging of Cells, Albert I. Lansing, in a most interesting discussion of certain basic problems, points out that aging means different things to different persons. To the biologist, aging is a process of unfavorable change in any adult organism, usually correlated with the passage of time, while "to the individual woman, aging means the loss of physical attractiveness; to her, aging is a cosmetic problem. To the individual man, aging means little more than loss of sexual potency." After some generalizations about the whole problem, Lansing notes that by largely conquering infectious diseases we live on to have degenerative diseases and cancer develop. He considers that age pigments show that aging begins rather abruptly at the time of maturity. The evident tendency of age pigments and calcium salts to accumulate with increased age is perhaps due to a lack of a mechanism for eliminating these two insoluble substances. Lansing speculates on the possibility that the increase in calcium content in the cell reduces the cell permeability and thus may account for the accumulation of materials in the cell.

Chapter 2, The Life History of the Neuron, by Paul Weiss, points out that only recently has it been recognized that the neuron, as a whole, is not a stable unit. The protoplasmic constituents are constantly changing, and part of the protoplasm must remain reproductive to replace the parts that are being constantly lost. The fact that the renewal process going on within the neuron is inadequate leads to the decline of adaptive features.

A discussion by Dr. Ralph Gerard of these two chapters occupies two pages of fine print and raises many interesting questions.

Chapter 3, Brain Metabolism in Relation to Aging, by Harold E. Himwich and Williamina A. Himwich, and Chaper 4, Human Cerebral Blood Flow and Oxygen Consumption as Related to Aging, by Seymour S. Kety, are adequate résumés of this subject. For want of space, one cannot go into detail or abstract each chapter.

Chapter 5, Aging and Intelligence, by Irving Lorge, brings out some of the changes in thinking about the effect of aging on intelligence. For some years, we have thought that the older person loses more of his intellectual capacities than he actually does. This erroneous thinking has been based on comparisons between various test samplings of the different age groups in the population. Scores on standard intelligence tests correlate very closely with the amount of education the individual has had. Troops in World War II and since then have an average of two or more years of education than did World War I troops. In comparing the young man of 25 with the man of 55, it is quite incorrect to assume that any difference found indicates the amount of deterioration which the present young man of 25 will have by the time he is 55. The few excellent reports that we have had of longitudinal studies with the same individuals

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(Continued from page 66A)

being examined in the late teens and then again twenty-five or thirty-five years later have shown in many instances an actual gain rather than a loss.

Chapter 6, Experimental Prolongation of The Life Span, by Frank Pope, Wanda Lunsford, and Clive M. McCay, brings out material new and interesting to many of us. A possible interrelationship between hibernation, length of life, and diseases of old age is pointed out. Animal studies show that if white rats are fed diets excellent in quality but lacking in quantity, growth is retarded while the life span is lengthened. Also, as a result of such a diet, the body becomes an unfavorable spot for tumors to develop. Although it has been well known for two centuries that human females have a longer life span than males, less is known about the lower animals, except that the same rule seems to apply, by and large. This rule can, however, be reversed in white rats by dietary measures so that the males outlive the females.

The remaining chapters, all of them excellent, cannot be discussed. Anyone wishing to keep up on the problems of geriatrics should read this superior volume.

KARL M. BOWMAN, M.D.
San Francisco, California

The Clinical Management of Varicose Veins

DAVID W. BARROW, M.D., 1957. New York: Paul B. Hoeber, Inc. Second edition. 169 pages. Illustrated. $6.

This monograph is based on the author's vast experience and contains much helpful and practical information. The second revised edition has been enlarged with the discussion of the more recent methods of treatment. The book is very well illustrated and clearly written in an easy, readable style.

The first part of the book containing the history, anatomy, physiology, etiology, and pathology of varicose veins is well presented and illustrated. The chapters on symptomatology and examination are concise and clear. It is regrettable that the importance of laboratory examinations is minimized and the discussion of the significance of sedimentation rate omitted.

The technics and indications for treatment with injection are clearly presented. The surgical technic for the ligation of the long and short saphenous vein and the surgical removal of the veins by stripping method are adequately discussed. The ligation of the incompetent communication veins is described in a separate chapter.

Complications such as varicose ulcer, varicose eczema, cellulitis, and thrombophlebitis are briefly discussed, and the Linton operation of postphlebitic syndromes is described. It is unfortunate that some of the newer methods of nonsurgical treatment of thrombophlebitis, varicose ulcer, and varicose veins are omitted. The value of the text would have been greatly enhanced by a more comprehensive and critical discussion of the numerous methods currently being utilized in the treatment of thrombophlebitis, varicose ulcers, and varicose eczema.

A short chapter on prophylaxis and care after treatment with emphasis on follow-up examination concludes the text.

The bibliography is minimal but adequate. Case histories are presented in detail.

JOSEPH KOVACS, M.D.
New York City

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"Recreation, Medicine, and the Humanities" is a booklet containing the opening address by Dr. Joseph B. Wolfe at the Third Southern Regional Institute on Hospital Recreation held at the University of North Carolina. Recreation for cardiac, geriatric, and psychiatric patients in the hospital setting is emphasized, and many of the observations on the benefits of recreation are applicable to all older people. Requests for a copy of the booklet should be sent to the University in Chapel Hill, North Carolina.

"Older People and the Industrial Community" presents a 46-page report on the 1957 spring meeting of the National Committee on Aging, which was devoted to older worker utilization, retirement plans, government programs, financing medical care, and retirement activity. Papers and panel presentations, representing the points of view of leading authorities in various industrial fields where older people are implicated, are brought together in this booklet. Single copies may be obtained for $1 by writing to the Committee, 345 East 46th Street, New York City 17.

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References: 1. Spies, T. D., et al.: J.A.M.A. 159:645, 1955. **2.** Spies, T. D., et al.: Postgrad. Med. 17:1, 1955. **3.** Gelli, G., and Della Santa, L.: Minerva Pediat. 7:1456, 1955. **4.** Guerra, F.: Fed. Proc. 12:326, 1953. **5.** Busse, E. A.: Clin. Med. 2:1105, 1955. **6.** Sticker, R. B.: Panel Discussion, Ohio State M. J. 52:1037, 1956.

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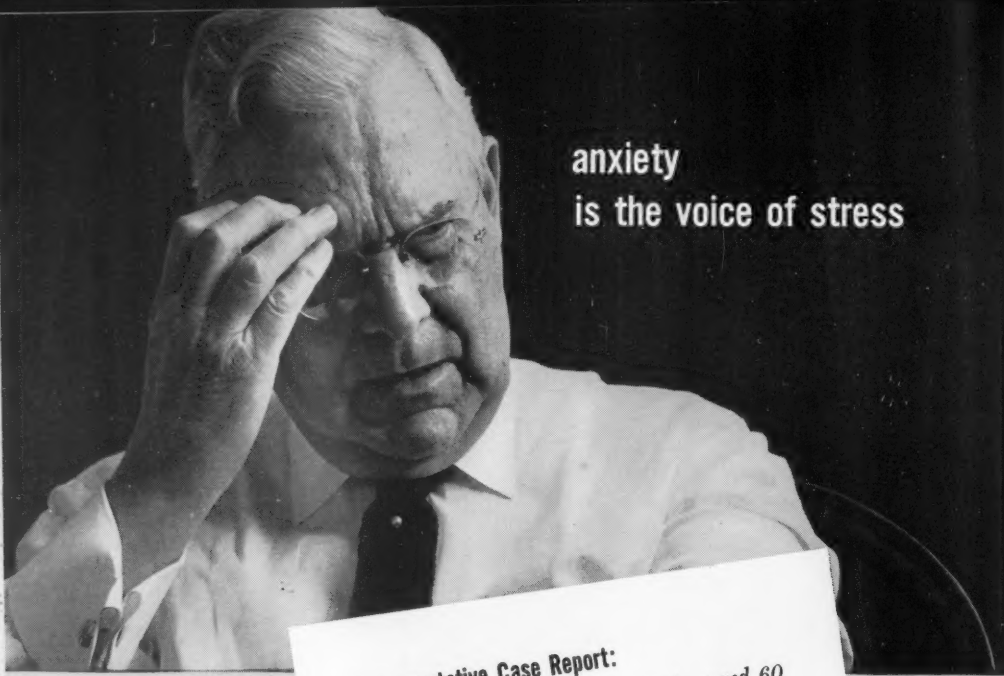

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Digests FROM CURRENT LITERATURE

Dislocation of the Shoulder Complicated by Complete Rupture of the Axillary Artery

B. STENER. J. Bone & Joint Surg. 39-B: 714-717, 1957.

A man of 87 had a complete rupture of the right axillary artery associated with an anteroinferior dislocation of the shoulder following a fall. One-half hour after the fall the arm was ischemic and without a palpable wrist pulse, and reduction by hippocratic manipulation was performed under anesthesia. Soon after reduction, a large hematoma appeared in the axilla. Systolic blood pressure fell from 220 mm. to 60 mm. of mercury. The stellate ganglion was blocked with Xylocaine in an attempt to release any vessel spasm. An attempt was made to aspirate the hematoma. Both procedures failed, and the hematoma increased.

Exploration of the axilla through the deltopectoral approach revealed the axillary artery to be completely severed below the origin of the subscapular artery. The ends of the artery were shredded, and the walls of the vessels were moderately arteriosclerotic. An end-to-end anastomosis of the axillary artery was performed with a continuous over-and-over suture of number 5-0 arterial silk. The radial pulse returned immediately.

Voluntary movements returned after the patient awakened from the anesthetic. An anticoagulant was given for about two weeks, beginning on the fifth postoperative day. Function of the arm returned with only a mild residual paresis of certain fingers, which was ascribed to partial injury of the brachial plexus.

Combined Action of Diamox and Potassium Bicarbonate in the Treatment of Chronic Glaucoma

D. A. CAMPBELL, J. JONES, N. E. A. RENNER, and E. L. TONKS. Brit. J. Opth. 41: 746-758, 1957.

The administration of potassium bicarbonate in doses of 1 gm. three times a day together with 250 mg. Diamox daily is effective in controlling intraocular pressure for considerable time. Diamox causes excretion of cations, especially sodium and potassium. However, continued use of Diamox results in decreasing diuretic effect, that is, the action is self-limiting in that the initial increases in urinary volume, in urinary *p*H, and in excretion of bicarbonate, sodium, and potassium all return to near normal, sometimes within three to four days. Concomitant with decreasing effect of Diamox is an increasing intraocular pressure.

The self-inhibiting effect of Diamox results from a reduction of the filtered glomerular load of bicarbonate secondary to the systemic acidosis produced or to the total quantity of base lost or to net body acidosis, with resultant inhibitory renal effect. Addition of potassium bicarbonate restores the response to Diamox, controls intraocular pressure, and prevents unpleasant side effects.

The distribution of the ionic constituents of the aqueous humor after Diamox suggests that the effect on the intraocular pressure is not the direct outcome of the inhibitory effect of the drug on carbonic anhydrase. Rather, it is probably caused by an alteration in the osmotic balance between the blood and aqueous humor independent of renal action or by a decrease in the base-binding capacity of the blood below normal, resulting in a lowered rate of formation of intraocular fluid.

Before using Diamox, hospital investigation should be carried out in respect to adequate urinary function, diurnal variation of intraocular pressure, and the response of the individual to Diamox and potassium bicarbonate.

Advances in Stapes Mobilization Operation for Otosclerotic Deafness

A. A. SCHEER. New York J. Med. 58: 191-194, 1958.

The operating microscope permits safer and more accurate freeing of an ankylosed stapes than was possible with a binocular loop. A local anesthetic is injected through a speculum using overhead light. Six-power magnification is used for the incision and for elevating the flap and tympanic membrane. The middle ear is inspected with 10-power magnification.

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Digests from Current Literature

(Continued from page 71A)

For instrumentation, 16-power magnification is used. First, pressure is exerted on the incus, observing the direction of force through the incudostapedial joint. Pressure is most likely to restore hearing when the force is transmitted through the head of the stapes to the posterior crus in an almost straight line. Mobility is achieved by (1) fracture of the footplate in the long axis, freeing the mobile portion; (2) transverse fracture of the footplate and anterior crus fracture, with posterior crus and mobile portion of the footplate transmitting sound; (3) stellate fracture of the footplate; or (4) freeing of the entire footplate.

If pressure on the incus produces no immediate results, a curved pick is used to free or fracture the footplate. By insertion of the pick directly into the otosclerotic mass, considerable force may be exerted. Patients with relatively slight hearing loss have greater chance of having the entire stapes mobilized intact. The majority of cases have no true otosclerotic mass, but whenever a single otosclerotic mass is attached to the anterior or posterior crus, hearing is restored in the operating room. When the footplate is diffusely thickened, mobilization is unsuccessful. If the footplate is mobile, but the crura are broken and cannot be placed in continuity with the footplate, a piece of dry gelfoam inserted between the crura and pushed down into contact with the footplate restores transmission in half the cases.

Stapes mobilization with the 2½-power loop improved hearing in 33 per cent of patients. With the changes in technic made possible by the operating microscope, 80 per cent of patients achieve better hearing.

Treatment of Venous Thrombosis by Continuous Local Infusions of Streptokinase: Experimental Investigations

R. GOTTLOB and G. ZINNER. J. Internat. Coll. Surgeons 28: 575-584, 1957.

Preliminary investigations on bilateral femoral thromboses of cats showed small doses of Varidase (streptokinase) applied locally produced fibrinolysis. The lowest dose used

(Continued on page 74A)

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ATARAXOID *1.0* — scored orchid tablets, 1.0 mg. prednisolone and 10 mg. hydroxyzine HCl, bottles of 100.

1. Tillis, H. H.: Am. Pract. & Digest Treat. 8:932, 1957.

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Digests from Current Literature

(Continued from page 72A)

for regional treatment was 87 units per kilogram per hour. The occurrence of a new thrombosis after discontinuance of the infusion suggests an anticoagulant be used following fibrinolysis.

In 9 out of 10 patients with deep or superficial venous thrombosis, favorable therapeutic results were observed after local treatment with small doses of Varidase. In the superficial thrombosis of the saphenous or pelvic veins, the drug was infused into the saphenous vein above the ankle. In the thrombosis of the deep veins of the lower leg, a continuous drip infusion was directed into the os calcis. To every 500 cc. of Ringer's fluid or a 5 per cent dextrose solution, 200-000 units of Varidase were added over a twelve-hour period.

No sign of pulmonary embolism was detected. The main toxic phenomena following intravenous Varidase consist of febrile reactions, fall in blood pressure, and temporary afibrinoginemia. Under local treatment the melting away of the thrombosis could be observed from hour to hour.

The dose of the enzyme, streptokinase, can be reduced because of the local application of continuous infusion.

Some Aspects of Geriatric Ophthalmology

J. H. KING, JR. Eye, Ear, Nose & Throat Month. 36: 667-671, 1957.

Ocular discomfort in the geriatric patient is caused by malposition of eyelids, trichiasis, chronic conjunctivitis associated with calcium concretions in palpebral conjunctiva, chronic meibomitis or lachrymal system infection, and keratitis from erosions, ulcers, abrasions, or foreign particles. Visual discomfort results from refractive errors or convergence insufficiency. Failing vision is caused by corneal diseases resulting from herpetic keratitis, dendritic ulcers, or corneal dystrophies.

Vascular lesions may lead to transient blackouts of vision, which may be symptomatic of thrombosis of basilar or internal carotid arteries, temporal arteritis, or impending retinal venous occlusion. Cataracts are responsible for nearly 60 per cent of blindness in patients over 60; if the patient's life expectancy is reasonable, operation should be performed irrespective of age. Early macular degeneration, which may be detected by use of the Amsler chart, is found in about 30 per cent of patients over 65, and the percentage increases with advancing age. Glaucoma is a common cause of geriatric optic atrophy, necessitating early and intensive therapy with miotics, intravenous Diamox, and, often, surgery.

Subnormal vision can be greatly helped by several devices on the market for magnifying the retinal image.

Ophthalmoscopy and the determination of visual acuity are essential for the complete physical examination of any elderly person.

Hiatus Hernia, Peptic Esophagitis, and Peptic Ulcer

G. M. CARVER. Surg., Gynec. & Obst. 77: 77-81, 1958.

The triad of hiatus hernia, esophagitis, and peptic ulcer occurs in about 20 per cent of patients with peptic esophagitis. Patients suffering from a peptic ulcer and hiatus hernia are prone to the development of severe reflux esophagitis because of the high acid and peptic content of their gastric secretions. Careful medical treatment of these patients has proved disappointing, and esophageal stricture formation has been a frequent complication.

Early surgical treatment is recommended. The indications for operative repair include failure of medical measures to control symptoms of esophagitis; complications of peptic ulcer (hemorrhage, perforation, obstruction, intractable pain) when associated with hiatus hernia and esophagitis; and stenosing peptic esophagitis. Subtotal gastric resection with simultaneous repair of the hiatus hernia is employed. The technic of transabdominal repair of the hernia, with emphasis on the preservation of the phrenoesophageal ligaments and anatomic closure of the esophageal hiatus, is recommended.

Only 4 of 30 patients with hiatus hernia, esophagitis, and peptic ulceration responded satisfactorily to medical management. Of 5 patients who had a subtotal resection for duodenal ulcer without repair of the hernia, only one obtained a satisfactory result. All of the 13 patients who had early gastric resection with transabdominal hiatus hernia repair were relieved of their symptoms during a postoperative follow-up of two to ten years.

(Continued on page 76A)

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Digests from Current Literature

(Continued from page 74A)

Craniopharyngiomas in the Aged

P. TIBERIN, G. M. GOLDBERG, and A. SCHWARTZ. Neurology 8: 51-54, 1958.

Mental deterioration is the most obvious symptom of craniopharyngioma growing late in life. Manifestations in older patients vary greatly, probably resulting in many unrecognized cases.

The mental deterioration is similar to the effect of cerebral arteriosclerosis. Loss of interest in usual work, sleepiness, disorientation, urinary incontinence, neglect of personal hygiene, forgetfulness, and slowed speech appear. The personality changes may be the only manifestations, or they may obscure more specific changes, such as progressive loss of vision and pituitary failure. Frontal lobe signs, such as grasping, hyperactive reflexes, and pyramidal signs indicate interference with blood supply to the frontal lobe. Bradycardia, hypothermia, and hypotension are a result of extension to the hypothalamus. Loss of consciousness or falling without syncope are common. No combination of symptoms is pathognomonic.

Enlargement of the sella turcica is evident, but suprasellar calcifications have not been demonstrated roentgenographically. The electroencephalogram may have localizing value but can be normal.

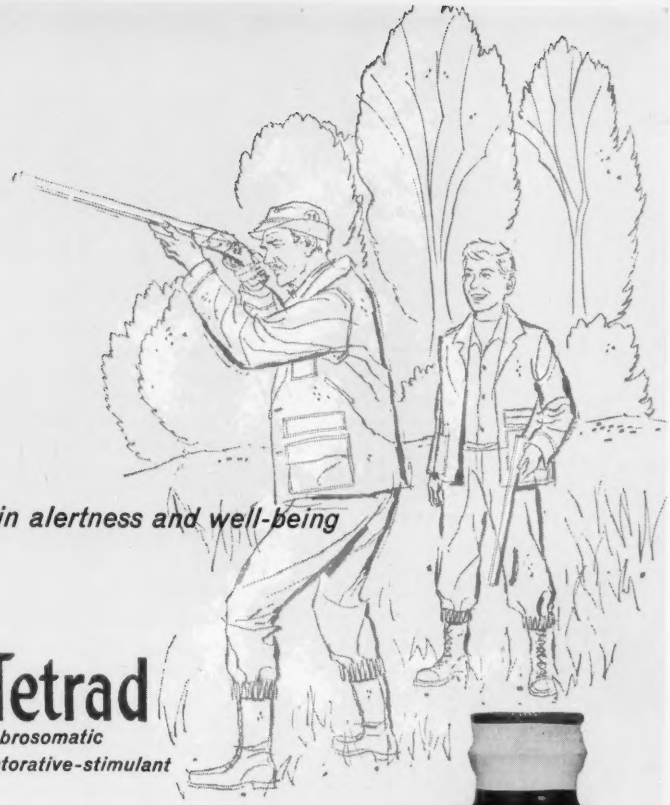
Patients with hypothalamic lesions and pituitary failure are in no condition to respond to the stress of surgery. Postoperative shock and early death are the usual outcome.

Parabiosis Between Old and Young Rats

C. M. MCCAY, F. POPE, W. LUNSFORD, G. SPERLING, and P. SAMBHAVAPHOL. Gerontologia 1: 7-17, 1957.

Parabiosis between animals of different ages is a promising technic for studying the possibility of reversing the pathologic changes of old age. Preliminary studies have indicated that litter mates combined in youth can survive into old age. Using rats and Syrian hamsters, pairs of animals of very different ages were combined. Ten pairs of animals differing in age by three to five months, but of equal weight and size, survived for more than one year after the operation, and the older members of each pair are now in the last third of life.

(Continued on page 78A)



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Unlike tranquilizers, TETRAD *improves* mental and physical energy, supplements decreasing hormonal function and improves cerebral circulation and activity.

℞ *TETRAD for the "past forty" group—ambulatory patients—institutionalized aged—*

FORMULA: Pentylenetetrazol, 100 mg; nicotinic acid, 50 mg; tetraiodothyronine, 10 mcg; methyltestosterone, 1 mg; ethinyl estradiol, 0.002 mg.

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stops vertigo

and a glance at the formula shows two reasons why

each ANTIVERT *tablet contains:*

Meclizine (12.5 mg.)
to ease vestibular distention

Nicotinic Acid (50 mg.)
for prompt vasodilation

Dosage: one tablet before each meal. In bottles of 100 blue-and-white scored tablets. Prescription only.

ANTIVERT in geriatrics
Vertigo is a leading complaint among the aged. Help your elderly vertiginous patients with ANTIVERT.

Roerig
New York 17, New York
Division, Chas. Pfizer & Co., Inc.

Digests from Current Literature

(Continued from page 76A)

Recently, pairs of rats have been united that differ in age by more than four hundred days, a difference greater than half of the normal life span. This is roughly equivalent to combining people that are 5 and 47 years of age. Only pairs of the same sex with the same sire and dam have been united so far. Rats can also be combined facing in opposite directions; this technic may be useful in nutrition and psychology studies.

Meticulous attention to surgical technic and anesthesia is essential for the success of the operation. Avertin or sodium cyclopal was used for anesthesia. Twenty pairs of rats from a total of 69 pairs have succumbed, two pairs dying from parabiotic disease. The severe diarrhea found in this disease could not be controlled by diet or drugs. Tranquilizing drugs are very useful in preventing fighting between the parabiotic rats.

Study of Alcoholism with Onset Forty-Five Years or Older

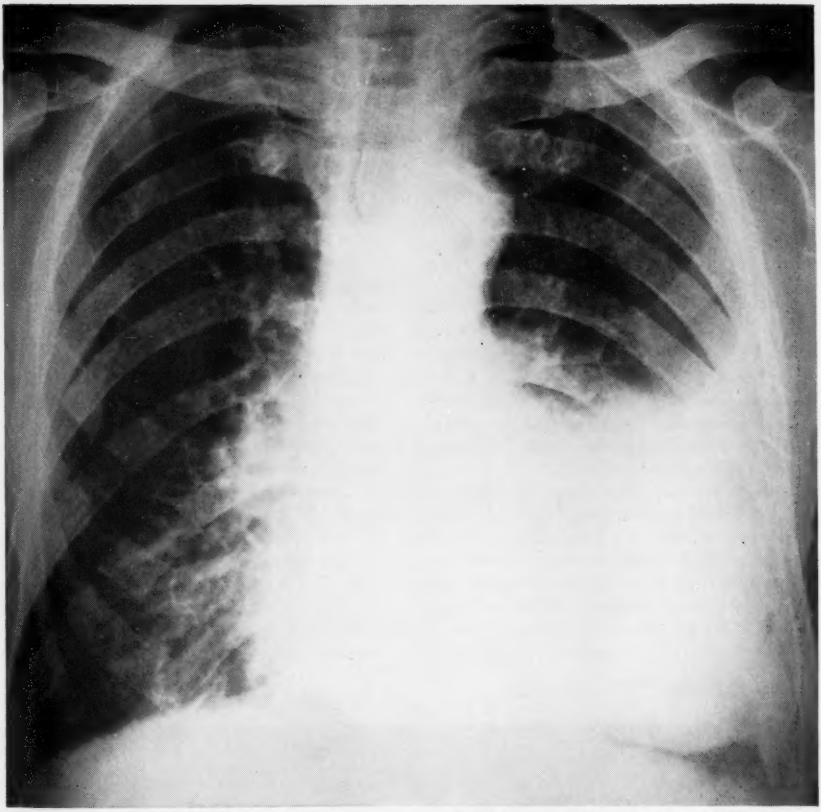
H. H. MOORHEAD. Bull. New York Acad. Med. 34: 99-108, 1958.

The onset of alcoholism in persons over 45 years of age is as harmful as in younger persons. A significant family background of alcoholism, mental disorders, and suicides is usually found. Broken homes, only child status, and over-attachment to a parent are important factors in the early life of the alcoholic patient. The average intelligence is above normal, with most patients being employed. Very few marriages are happy. Sexual adjustment is low. While the onset of drinking varies, the average age when drinking becomes a problem is about 50 years. No typical personality make-up is found.

The reasons for drinking as given by patients include dissatisfaction with work, loss of a family member, dissatisfaction with a relative, illness, and social or business influences. If not psychotic, the alcoholic patient is a depressed person who is critical and irritable with hostility and guilt feelings. Immaturity is a common finding and is often associated with sensitivity and self-centered ways.

The alcoholic person requires a prolonged period of abstinence and re-education. After physical health is restored, a well-planned program of occupational therapy and social

(Continued on page 80A)



Choledyl, 400 mg. q.i.d., relieved associated bronchospasm

Diagnosis—emphysema, chronic bronchitis and atelectasis. Now, to prevent the crisis episode in *emphysema*, prescribe Choledyl. Choledyl, the easily absorbed oral xanthine, relieves bronchospasm, prevents acute asthma attacks, stimulates the respiratory center, helps relieve interstitial edema . . . with less gastric irritation than with oral aminophylline.

to prevent the crisis episode in emphysema

CHOLEDYL®

Brand of oxtriphylline
formerly a product of Nepera Laboratories

WARNER-CHILCOTT

(Continued from page 78A)

activities is begun. After the period of hospitalization, the patients continue treatment. About one-half are definitely benefited.

The abstinent group is more capable of management of stress factors. This group mains cooperative and receptive during treatment. Abstinence is rare in alcoholic persons voluntarily seeking aid.

The Old-Timers Club

B. RUBIN and S. B. EISEN. Arch. Neurol. & Psychiat. 78: 113-120, 1958.

An autonomous patient-group in state mental hospitals with an active milieu program may provide a therapeutic atmosphere among psychotic patients.

Isolated, uncommunicative, chronic hospitalized parole patients engaged in no specific chore or activity and headed by an active verbal patient formed a self-governed hospital service club. The organization made signs, helped publicize clean-up and fire-prevention weeks, directed more confused patients, and in general helped each other. Formal minutes of meetings were kept, voluntary dues were collected, and membership cards and pins were issued. The club was run on a democratic basis. Provision of a club room added permanence to the group, which was tacitly accepted by the majority of hospital personnel.

The existence of this club indicated that patients in the even more homogenous chronic state hospital population develop attitudes and relationships toward and among themselves. The autonomous nature of such a group is intrinsically advantageous and might be lost if the activities were under staff supervision.

Temporary dissolution of the club brought about regressive behavior among some of its members and a great demand for its reorganization attested to its popularity and therapeutic values. Members derived a sense of belonging and gained self-esteem within the hospital community where there is little to distinguish one patient from another. Furthermore, the club presented an opportunity for the members to socialize in a more appropriate environment than in the wards. Not only did the club offer outlets to handle boredom constructively, but it avoided the

ideal physiologic corrective for

constipation

in the **elderly**

NEO-CULTOL works naturally toward restoring to the intestines of older patients the normal aciduric flora that is so frequently lacking . . . to provide lubrication to feces that are so often dry . . . to avoid distressing flatulence by suppressing putrefactive bacteria.

attendant culture, which, in its effort to maintain status quo seemed to impede the patients' move toward health.

Appendicitis in the Aged

R. L. BRADLEY. Gastroenterology 33: 925-928, 1958.

Appendicitis in the aged is a treacherous disease. Seldom does it present the fulminating picture that is seen in the young. Rather, it often presents vague symptoms of gastrointestinal distress with the true nature of the disease process being identified with the onset of complications.

During youth, the lymphoid tissue of the appendix undergoes a diffuse hyperplasia, occasionally enough to produce obstruction. As the individual grows older, it undergoes fibrosis, and the hyperplasia resolves. Secretions are accordingly decreased as is the chance of obstruction and resultant distention.

In the aged, symptoms of an acute attack of appendicitis are often subjectively minimized. Previous episodes with spontaneous subsidence may have occurred, and the patient does not attach undue significance to the present similar attack. Also, in the older patient, other known intra-abdominal pathologic processes, such as peptic ulcer, diverticulitis, and cardiac disease or previous abdominal surgery, minimize consideration of appendicitis. If the patient has had cerebral accidents or arteriosclerotic dementia, he may be unable to evaluate the symptoms. In many of these individuals, only with the onset of complications of diffuse peritonitis, abscess formation, or bowel obstruction does the diagnosis become apparent. Then, too, as the result of a subsided, nonoperated appendicitis, bands from the omentum to the appendical area frequently cause a strangulating obstruction.

Abscess formation, perforation, or other complications are often undiscovered until laparotomy is performed because of another diagnosis or until postmortem examination.

Spectacular increases in the number of older people in the nation merit a re-evaluation of appendicitis. The most important diagnostic weapon in this respect is to consider appendicitis as a possibility in any surgical abdomen, regardless of the age of the patient.

(Continued on page 82A)

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L. Acidophilus in chocolate-flavored mineral oil jelly

NEO-CULTOL is pleasant to use—because of its chocolate-pudding flavor—because there is no griping, no rush, no strain, no leakage.

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Digests from Current Literature

(Continued from page 81A)

Prostheses and the Older Patient

H. W. PARK and R. E. MILLER. Southern M. J. 51: 27-30, 1958.

Age alone is not a contraindication to fitting a limb prosthesis and training. Early referral, evaluation, and ambulation improve self-care, self-support, and self-esteem.

Under the sponsorship of the Baruch Center of Physical Medicine at the Medical College of Virginia, a Prosthetics Evaluation Board meets bimonthly to serve the amputees in that area. Physical medicine, rehabilitation, orthopedics, physical therapy, occupational therapy, social service, visiting nurses, prosthetics manufacturers, crippled children's bureau, and vocational rehabilitation service are represented on the board.

The board surveys the general needs of the patient from the medical-social-economic view, presents the apparatus, outlines therapy, and recommends educational and vocational goals. The prescription is forwarded to the referring physician or agency. Most of the lower extremity amputees are admitted to the Center. The upper extremity problems are ordinarily treated on an outpatient basis. The Board reviews each case prior to discharge, and the patient is seen at regular intervals for follow-up.

From June 1955 to October 1956 the Board reviewed 123 patients, 18 of whom were over 55 years of age. Of these 18, 8 had satisfactory results. The principal deterrents have been the loss of motivation and physical stamina by prolonged periods of inactivity and unwarranted optimism as to what to hope for in a given period of time. The majority had atrophy, contractures, and emotional dependency because the fitting of the prosthesis had been delayed more than twelve months. A member of the family often thwarts the motivation of an amputee to use an artificial limb by early purchase of a wheel chair. A few patients are not candidates for prosthesis because of severe claudication of the remaining extremity.

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...as an aid in lowering blood cholesterol

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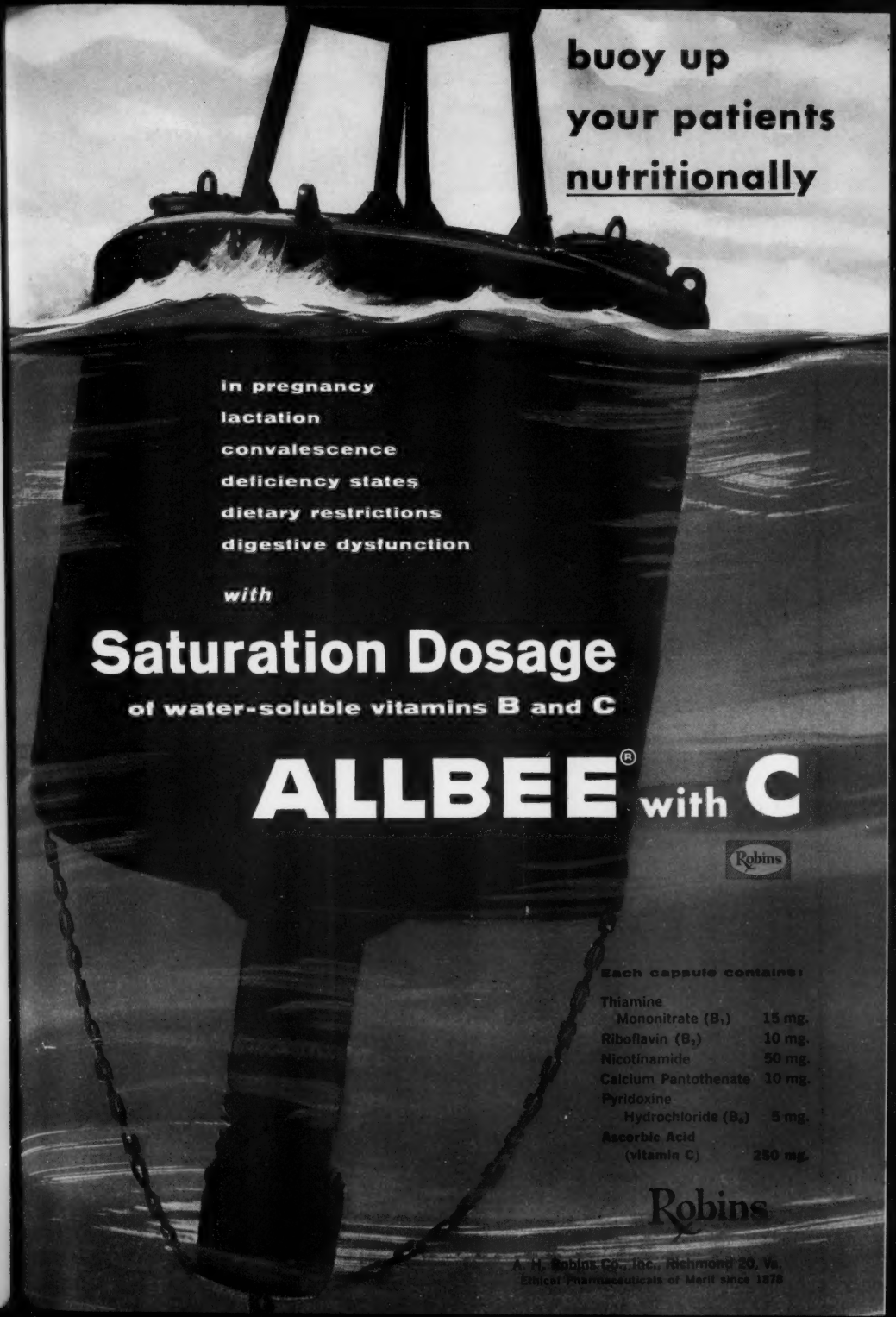
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Activities and Announcements

All news and announcements for this department should reach the editorial office six weeks before publication date. Please direct all communications to News Editor, GERIATRICS, *84 South Tenth Street, Minneapolis 3, Minnesota.*

Conferences on Aging

The American Geriatrics Society will hold its annual meeting June 19 and 20 at the Mark Hopkins Hotel in San Francisco. Reservations may be made by writing to Mr. Walter G. Swanson, vice-president and general manager, San Francisco Convention and Visitors Bureau, 300 Civic Auditorium, San Francisco.

The National Geriatrics Society will hold its Fifth Annual Convention and Exposition May 12 to 15 at the Henry Hudson Hotel in New York City. For further information regarding the meeting, write to Stanley H. Hoffman, 225 East 34th Street, Bronx, New York.

The Fourth Annual Meeting of the Western Gerontological Society will be held at the Hotel Statler in Los Angeles May 3 to 4. Membership in the Society is open to residents of California, Hawaii, Washington, Oregon, Idaho, Nevada, Arizona, and New Mexico. Further information about the meeting may be obtained by writing to the program chairman, Dr. Charles A. Preuss, 1317 Santa Barbara Street, Santa Barbara, California.

•

Other Meetings of Geriatric Interest

May 8 to 9—*President's Committee on Employment of the Physically Handicapped,* Washington, D.C.

May 11 to 16—*National Conference on Social Welfare,* Chicago.

May 16 to 20—*National Conference of Jewish Communal Services,* Chicago.

May 18 to 21—*National Industrial Recreation Association,* Fort Worth, Texas.

May 19 to 25—*National Tuberculosis Association,* annual meeting, Philadelphia.

May 29 to 31—*First Manitoba Conference on Aging,* University of Manitoba, Winnipeg, Canada.

(Continued on page 86A)

UNIQUE

in the treatment of severe hypertension

BECAUSE

it increases renal blood flow

Inherent as a basic problem of severe hypertension is renal ischemia. Even though they reduce blood pressure to varying degrees, antihypertensive agents may often diminish renal blood flow.

Apresoline not only lowers blood pressure but increases renal blood flow and cardiac output, producing a "most striking improvement in cardiovascular and renal function . . ."*

*Judson, W. E., Hollander, W., and Wilkins, R. W.: Circulation *13*:664 (May) 1956.

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(hydralazine hydrochloride CIBA)

SUPPLIED:
Ampuls, 1 ml., 20 mg. per ml.
Tablets, 10 mg. (yellow, double-scored), 25 mg. (blue, coated), 50 mg. (pink, coated); bottles of 100, 500 and 1000. Tablets, 100 mg. (orange, coated); bottles of 100 and 1000.

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Activities and Announcements

(Continued from page 84A)

June 1 to 6—*1958 Canadian Conference on Social Work,* Montreal, Canada.

June 4 and 5—*Second Governor's Conference on Aging,* Madison, Wisconsin.

June 15 to 21—*American Physical Therapy Association,* thirty-fifth annual meeting, Olympic Hotel, Seattle.

October 12 to 15—*National Rehabilitation Association,* annual conference, George Vanderbilt Hotel, Asheville, North Carolina.

October 12 to 15—*American Heart Association,* annual meeting, San Francisco.

October 20 to 23—*Mental Hospital Institute,* Hotel Muehlebach, Kansas City, Missouri.

October 27 to 31—*American Public Health Association,* annual meeting, St. Louis.

November 6 to 8—*Gerontological Society,* eleventh annual meeting, Bellevue-Stratford Hotel, Philadelphia.

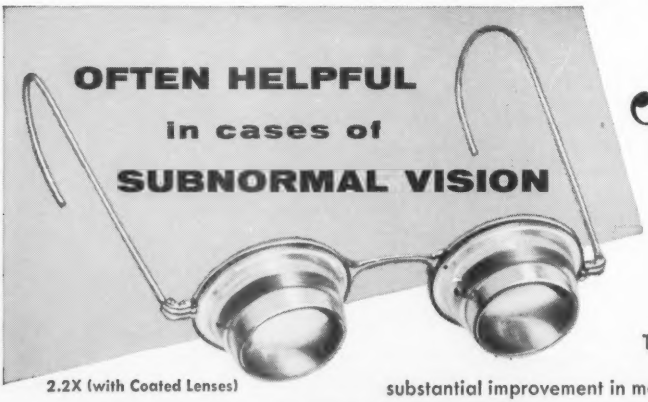
•

City Offers New Programs for Elderly

New York City has established two controlled programs to accept referrals from physicians on a planned basis to meet the special needs of the individual older patient. Day centers for older persons are sponsored by the New York City Department of Welfare, in cooperation with interested community agencies and individuals. Persons 60 years and over may apply for membership. The center provides a professionally supervised, planned program with a wide choice of activities, including arts and crafts, trips, excursions, discussions, performance with instrumental, choral, and acting groups, and participation in committee assignments. The trained workers in the centers cooperate with the physician by following his recommendations for the optimum plan for the patient.

The Senior Citizens Service Corps, second of the programs, is sponsored by the Mayor's Advisory Committee for the Aged and offers an opportunity for men and women 60 and over to engage in volunteer community service, which includes visiting and performing simple services for hospitalized or homebound older persons, and projects, such as packaging surgical supplies for voluntary hospitals and sewing for the Cancer Committee.

(Continued on page 90A)



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Zactirin*

NON-NARCOTIC

Potently Analgesic

Effectively Anti-inflammatory

2 ZACTIRIN tablets are equivalent in analgesic potency to ½ grain of codeine plus 10 grains of acetylsalicylic acid.

Supplied: Distinctive, 2-layer yellow-and-green tablets, bottles of 48. Each tablet contains 75 mg. of ethoheptazine citrate and 325 mg. (5 grains) of acetylsalicylic acid.

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HOW THIS HOT WHOLE WHEAT CEREAL CAN HELP ESTABLISH GOOD NUTRITION

Pettijohns rolled wheat cereal has a real contribution to make to the diet of older people. It is high in protein, Vitamin B_1, iron and phosphorous. It is low in sodium and fat. It is easily digested and assimilated. And, of almost equal importance, it *tempts* the appetite with its deliciously different flavor and texture.

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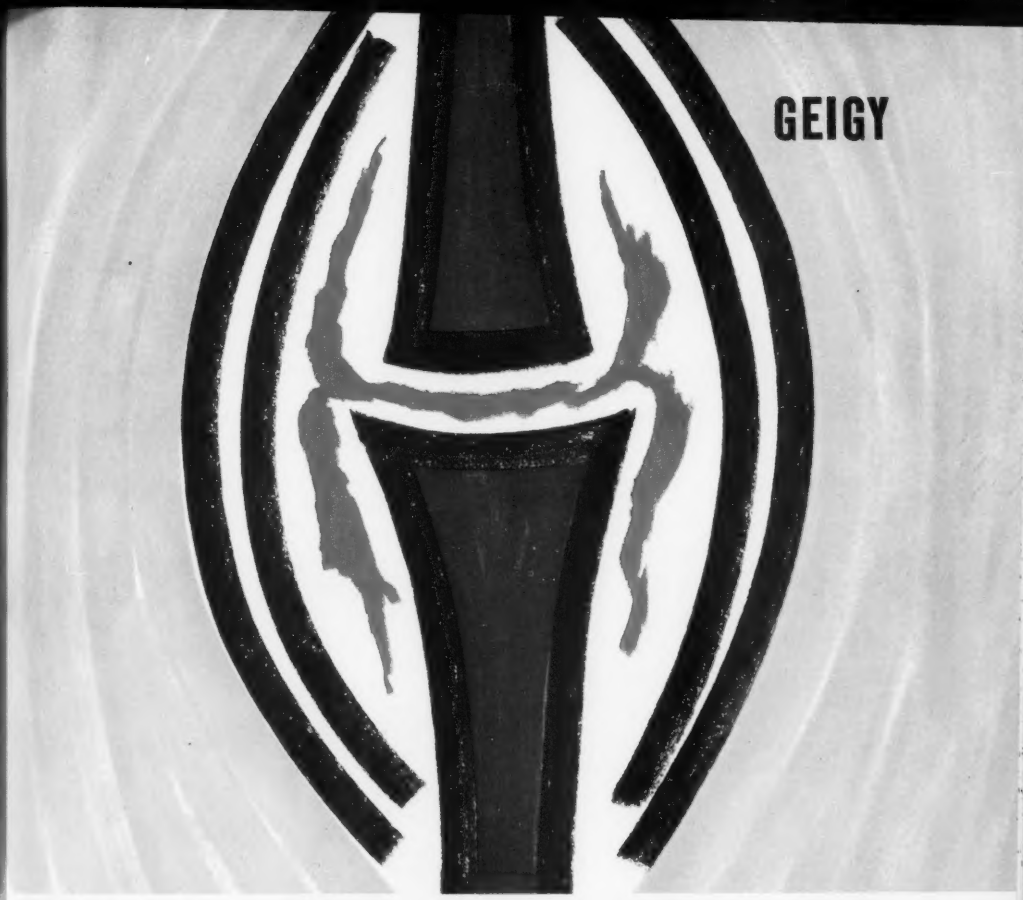

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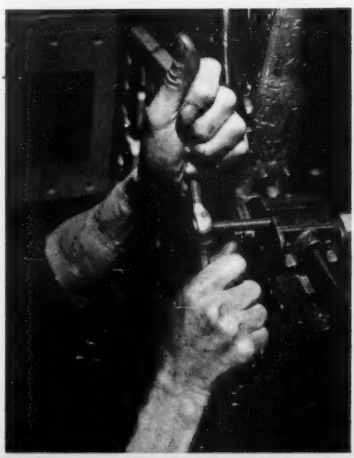
BUTAZOLIDIN being a potent therapeutic agent, physicians unfamiliar with its use are urged to send for detailed literature before instituting therapy.

(1) Denko, C. W.; Ruml, D., and Bergenstal, D. M.: Am. Pract. & Digest Treat. 6:1865, 1955. (2) Kuzell, W. C., et al.: New England J. Med. 256:388, 1957. (3) Smyth, C. J., and Clark, G. M.: J. Chron. Dis. 5:734, 1957.

BUTAZOLIDIN® (phenylbutazone GEIGY): Red coated tablets of 100 mg. BUTAZOLIDIN® Alka: Capsules containing Butazolidin (phenylbutazone GEIGY) 100 mg.; aluminum hydroxide 100 mg.; magnesium trisilicate 150 mg.; homatropine methylbromide 1.25 mg.



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- produces two to five times the weight loss achieved by dietary means alone[1,5]
- avoids nervous tension and jitters; rarely affects sleep[1-3]
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—well tolerated for use in moderate hypertension, chronic cardiac disease or diabetes.

(1) Golvin, E. P.; McGavack, T. H., and Konigsberg, S.: Am. J. Digest. Dis. *1*:155, 1956. (2) Holt, J. O. S., Jr.: Dallas M. J. *42*:497, 1956. (3) Natenshon, A. L.: Am. Pract. & Digest Treat. *7*:1456, 1956. (4) Council on Pharmacy and Chemistry, New and Nonofficial Remedies: J.A.M.A. *163*:356 (Feb. 2) 1957. (5) Ressler, C.: J.A.M.A. *165*:135 (Sept. 14) 1957.

PRELUDIN® (brand of phenmetrazine hydrochloride). Scored, square, pink tablets of 25 mg. Under license from C. H. Boehringer Sohn, Ingelheim.

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Patients with coronary heart disease have higher serum cholesterol levels than normal, and hypercholesteremia frequently leads to coronary thrombosis.[1]

The iodides inhibit the increase of cholesterol in the liver and blood and are generally employed in arteriosclerosis, coronary sclerosis and angina pectoris.[2] However, they frequently cause iodism and adverse reactions.

Iodo-Niacin may be administered in full dosage for a year or longer with no apparent hazard of iodism. It not only reduces hypercholesteremia but but also reiieves the symptoms of arteriosclerosis[3,4].

Niacinamide hydroiodide, contained in Iodo-Niacin, prevents iodism by a physiological mechanism similar to that of niacinamide in pellagra.[3]

Iodo-Niacin Tablets contain potassium iodide 135 mg. and niacinamide hydroiodide 25 mg. The recommended dosage is 2 tablets three or four times daily. In emergencies Iodo-Niacin Ampuls may be used for immediate action.

HYPERCHOLESTEREMIA

Reduced Without IODISM

IODO-NIACIN*

Reduces Blood Cholesterol

1. *J.A.M.A.* 164:1912, 1957. 2. Sollmann's *Manual of Pharmacology*, 8th ed., 1957, pp. 1121-22. 3. *Am. J. Digest Dis.* 22:5, 1955. 4. *M. Times* 84:741, 1956.

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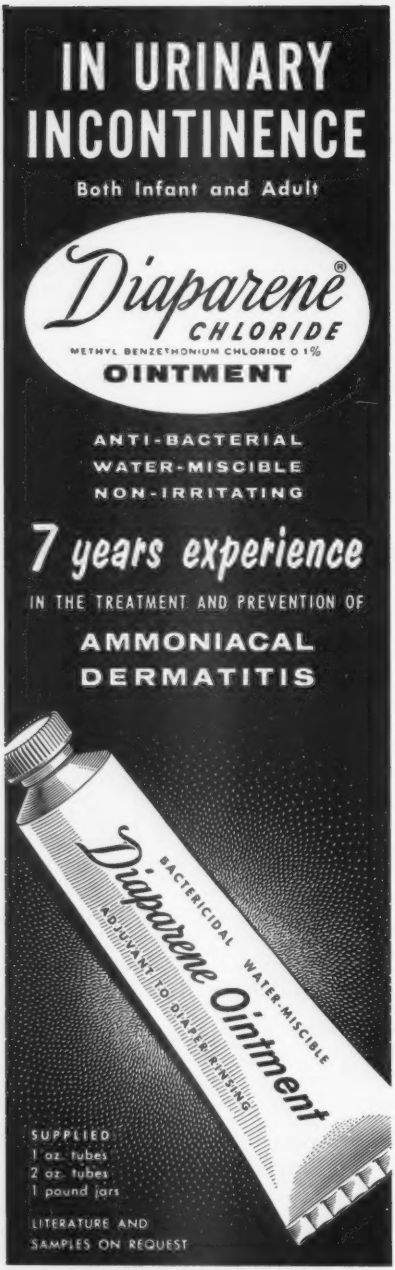

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Activities and Announcements

(Continued from page 86A)

Postgraduate Course in Geriatric Medicine

The Washington University School of Medicine will conduct a postgraduate course in geriatric medicine with special emphasis on heart disease and psychosocial problems of later life at the University on Saturday, May 24, and Sunday, May 25. This course will feature outstanding speakers from the St. Louis area and several authorities in the field of geriatrics from other universities. Clinical application of the basic principles of disease in later life will be stressed.

This course is tuition free, and category I credit will be granted to members of the American Academy of General Practice. For further information write Dr. John C. Herweg, assistant dean of postgraduate education, Washington University School of Medicine, St. Louis, Missouri.

•

Physical Medicine and Rehabilitation Postgraduate Course

A six-month course in physical medicine and rehabilitation, with particular emphasis on the management of severe disability and chronic illness, will be offered by Highland View Hospital in affiliation with the Western Reserve University in Cleveland, Ohio, to start July 7. The course is designed for the resident or diplomate in an allied specialty and for the physician who plans to teach in an allied field. Application for admittance and fellowships should be addressed to Dr. Mieczyslaw Peszczynski, Department of Physical Medicine and Rehabilitation, Highland View Cuyahoga County Hospital, Harvard Road, Cleveland 22.

•

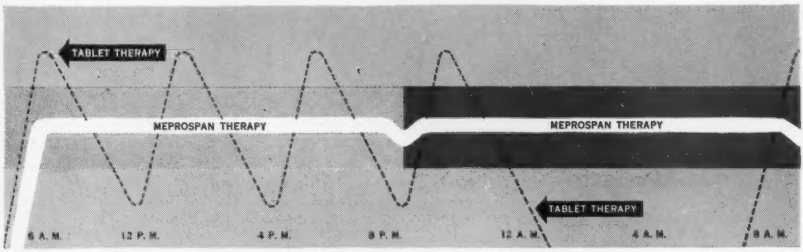
National Committee on the Aging Meets in Washington

Approximately 200 professional people attended the spring meeting of the National Committee on the Aging held in Washington, D.C. March 13 and 14, under the chairmanship of G. Warfield Hobbs. The program was devoted to reviews of federal government programs, activities outside of government, and legislation currently before the Congress. Government programs in health,

(Continued on page 94A)

New... meprobamate prolonged release capsules

Evenly sustain relaxation of mind and muscle 'round the clock



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RELIEVE ANXIETY, TENSION AND SKELETAL MUSCLE SPASM THROUGHOUT THE DAY.

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MEPROBAMATE IN **PROLONGED RELEASE** CAPSULES

- maintains constant level of relaxation
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Meprobamate (Wallace) .....**200 mg.**
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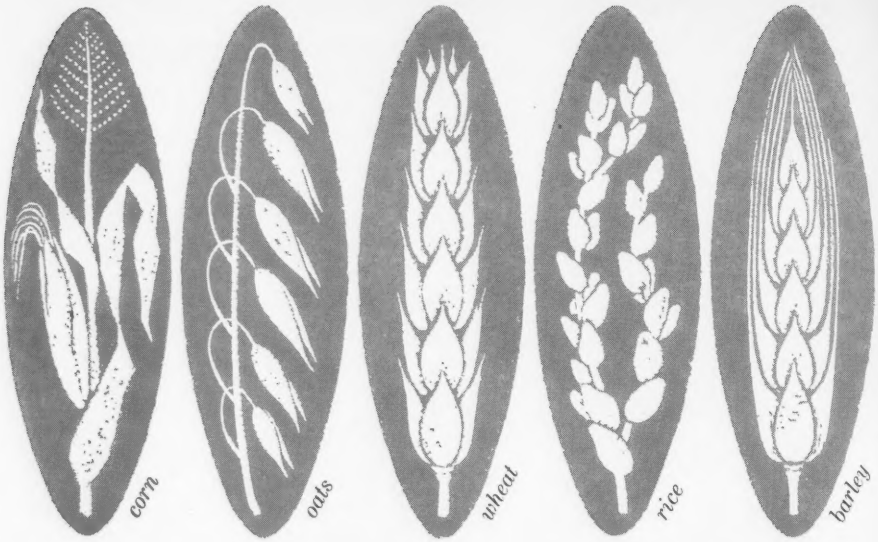

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Medical and nutrition experts are concerned because the teen-age, elderly, and obese individuals are consuming too many empty calories. When a moderate reduction of dietary fat is indicated, breakfast cereal calories merit consideration because they provide *low-fat content* and are full of good nutrition as shown in the table below. Whole grain, enriched, and restored breakfast cereals, hot or ready to eat, considered as a group contribute protein, important B vitamins, and essential minerals in addition to the carbohydrates needed for quick energy.

nutritive value of breakfast cereals
(based on composite average)

	cereal, 1 oz. dry weight basis
CALORIES	104
PROTEIN	3.1 gm.
FAT	0.6 gm.
CARBOHYDRATE	22 gm.
IRON	1.4 mg.
THIAMINE	0.12 mg.
RIBOFLAVIN	0.04 mg.
NIACIN	1.3 mg.
CHOLESTEROL	0

Cereal Institute, Inc.: The Nutritional Contribution of Breakfast Cereals. Chicago: Cereal Institute, Inc., 1956.

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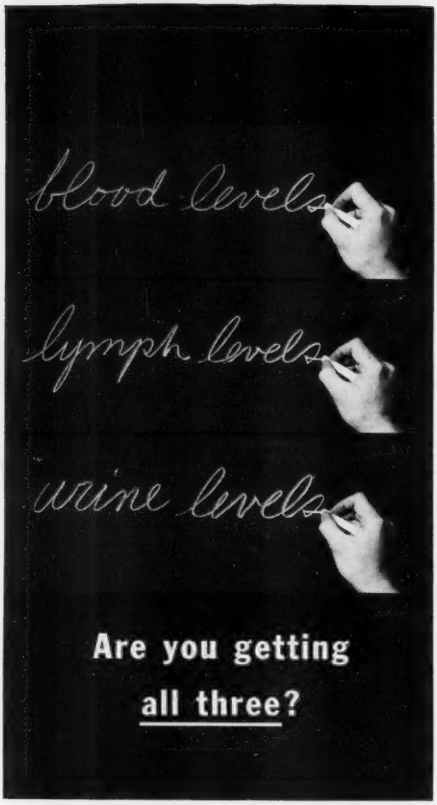
A research and educational endeavor devoted to the betterment of national nutrition



Effective management of urinary tract infections calls for satisfactory lymph and urine levels as well as adequate blood levels. Gantrisin provides all three within two hours of administration. Urinary tract infections are rapidly and safely controlled.

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GANTRISIN® — BRAND OF SULFISOXAZOLE

overnight laxative action

agoral®

the gentle laxative

One tablespoonful at bedtime produces a normal bowel movement in the morning

Ask your Warner-Chilcott representative for this dozen-pack of 2-oz. samples.

WARNER-CHILCOTT

Activities and Announcements

(Continued from page 90A)

income security, housing, and employment were described by Newell Brown, Assistant Secretary of Labor and Chairman of the Federal Council on Aging assisted by representatives of the departments and agencies most heavily involved. Developments in education and recreation and the growing interest of management and organized labor were outlined by a panel headed by Miss Ollie Randall, vice-chairman of the National Committee.

Health and income received the major share of attention during the two days. Surgeon General Leroy E. Burney discussed the problem of chronic illness in the later years and reviewed the highlights of the attack through research. Revealing some of the first findings of the National Health Survey, Dr. Burney reported that prevalence of chronic disease, sufficiently serious to constitute some limit on activity, rises from 8 per cent in the 15 to 44 years age group to 20 per cent in the population 45 to 64 years of age and to 57 per cent among the nation's 14.6 million persons over 65.

Discussions of methods of achieving economic security in old age revealed that wide differences of opinion persist, ranging from return to full personal responsibility to extension of coverage and increase of benefits under public and private pension systems, and partial removal of the Social Security retirement test (to encourage older persons to remain in employment). One speaker urged that costs of medical care and another that a cost-of-living factor should be introduced into the Social Security benefit structure.

The legislative review conducted by Mr. Theodor Schuchat of the Social Legislation Information Service focused on proposed increases in Social Security benefits, housing, a national conference on aging, and omnibus bills calling for grants-in-aid to the states and for a bureau of aging.

•

Southern Conference on Aging

The mounting problems of employment, health, income, and housing faced by older citizens in the south was the central theme of the Southern Regional Conference on Aging of the Council of State Governments, which was held at the Henry Grady Hotel,

(Continued on page 98A)

NEW . . .

for **advanced management**

of inflammatory

anorectal disorders

WYANOIDS® HC

Rectal Suppositories with Hydrocortisone, Wyeth

- Acute and chronic nonspecific proctitis
- Radiation proctitis
- Proctitis accompanying ulcerative colitis
- Medication proctitis
- Acute internal hemorrhoids
- Cryptitis
- Postoperative scar tissue with inflammatory reaction
- Internal anal pruritus

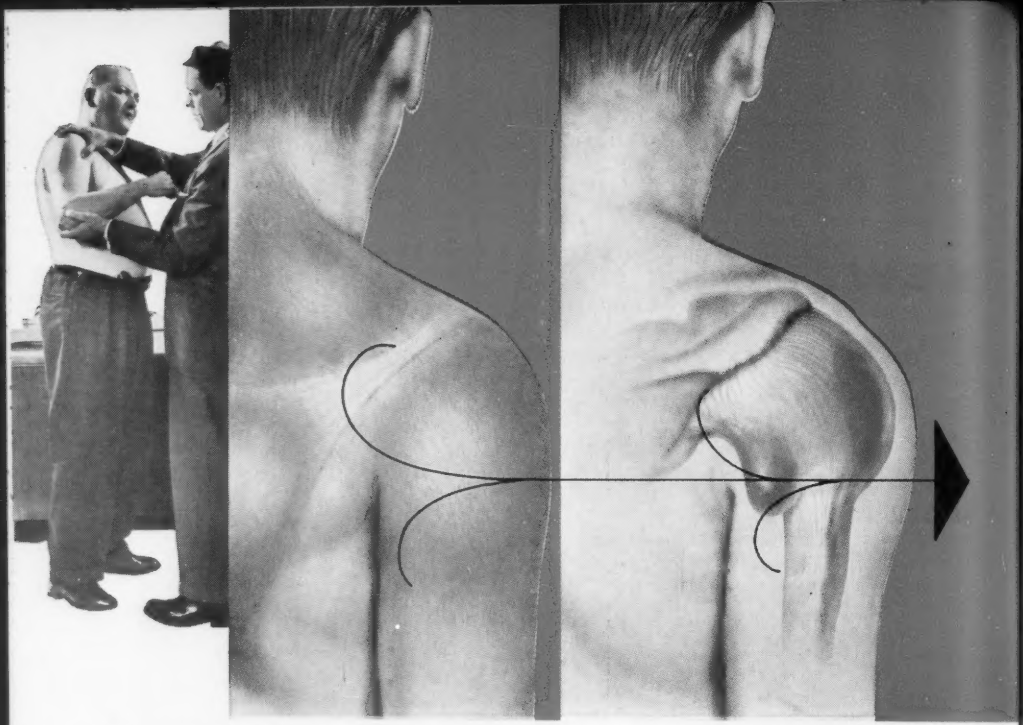
hydrocortisone to reduce inflammation and edema . . . plus the WYANOIDS formula to relieve itching, burning, soreness, pain

Composition: Each suppository contains hydrocortisone (as acetate), 10 mg.; extract belladonna, 0.5% (equiv. total alkaloids, 0.0063%); ephedrine sulfate, 0.1%; zinc oxide, boric acid, bismuth oxyiodide, bismuth subcarbonate, and balsam peru in an oleaginous base.

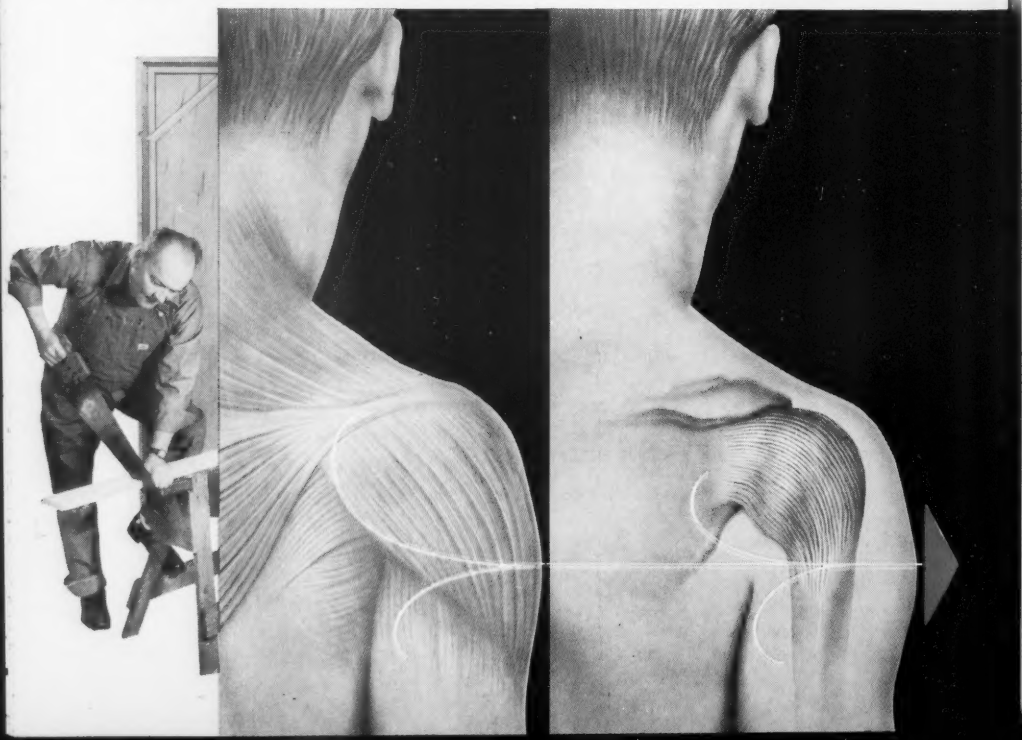
Supplied: WYANOIDS with Hydrocortisone, boxes of 12.

Comprehensive literature available on request

Wyeth®
Philadelphia 1, Pa



"Rheumatoid arthritis is a constitutional disease with symptoms affecting chiefly joints and muscles."[1] "Pain in the affected joint is accompanied by splinting of the adjacent muscles, with resultant 'muscle spasm.'"[2]



rheumatoid arthritis

involves both

joints and

muscles

only

MEPROLONE®

THE FIRST MEPROBAMATE PREDNISOLONE THERAPY

meprobamate to relieve muscle spasm
prednisolone to suppress inflammation

relieves both

muscle spasm

and joint inflammation

MEPROLONE is the only anti-rheumatic-antiarthritic designed to relieve simultaneously (a) muscle spasm (b) joint-muscle inflammation (c) physical distress . . . and may thereby help prevent deformity and disability in more arthritic patients to a greater degree than ever before.

SUPPLIED: Multiple Compressed Tablets in bottles of 100, in three formulas.
MEPROLONE-5—5.0 mg. prednisolone, 400 mg. meprobamate and 200 mg. dried aluminum hydroxide gel.
MEPROLONE-2—2.0 mg. prednisolone, 200 mg. meprobamate and 200 mg. dried aluminum hydroxide gel.
MEPROLONE-1—supplies 1.0 mg. prednisolone in the same formula as MEPROLONE-2.

1. Comroe's Arthritis: Hollander, J. L., p. 149 (Fifth Edition, Lea & Febiger, Philadelphia, Pa. 1953).
2. Merck Manual: Lyght, C. E., p. 1102 (Ninth Edition, Merck & Co., Inc., Rahway, N. J. 1956).

MSD MERCK SHARP & DOHME Philadelphia 1, Pa.
Division of MERCK & CO., Inc.

(Continued from page 94A)

Atlanta, Georgia, February 28 through March 1. There are now approximately 3.9 million persons 65 and over in the southern states, constituting 7.7 per cent of the southern civilian population.

Sessions were held on responsibility of state governments, federal activities and resources, and the relationship of citizen groups to government in the field of health. Sidney Spector, director, Interstate Clearing House on Mental Health, Council of State Governments, was in charge of the conference procedure.

•

Advisory Board on Problems of Older Worker

Pennsylvania's public law 475 has established a board on problems of older workers, which is empowered to advise the Secretary of Labor and Industry upon all matters related to problems of the aging and the aged. Through the use of community organization technics, it will seek to create job opportunities for older workers.

•

Attitudes Toward Hospital Care

Older patients have fewer complaints about their hospital care than younger patients. This is one of the conclusions brought about by the survey on "Polling Patients and Personnel," conducted by the Public Health Service with the cooperation of the American Hospital Association. Nearly 9,000 patients and 10,000 hospital administrators, doctors, and nursing personnel in 60 general hospitals were included in the survey. The survey of administrators, physicians, and personnel showed that age was also a factor in the number of omissions in nursing care.

•

Gerontologist Honored

William B. Kountz, M.D., assistant professor of clinical medicine and director of clinical services of the division of gerontology, Washington University, was one of two alumni honored at the University Founders' Day on

(Continued on page 102A)

Vita-Metrazol

reactivates

where apathy is the dominating symptom

Contains Metrazol, Vitamins B_1, B_2, B_6, niacinamide, panthenol, and 15% alcohol in a wine-like flavored elixir.

Average Dose: 2 teaspoonfuls *Vita*-Metrazol 3 or 4 times daily.

Metrazol®, brand of Pentylenetetrazol, E. Bilhuber, Inc.

KNOLL PHARMACEUTICAL COMPANY ORANGE NEW JERSEY

FALVIN HEMATINIC FULLY EFFICIENT FOR YOUR GERIATRIC PATIENTS

FALVIN Capsules are fully efficient not only in patients with severe anemias, but in the wide range of patients with marginal and incipient deficiencies – convalescents, the chronically ill, and the many listless, easily-fatigued older patients who may benefit from hematinic therapy. This across-the-board effectiveness is achieved because FALVIN with AUTRINIC consistently enhances absorption of the Vitamin B_{12} component. As a result, FALVIN is the oral hematinic you can depend on completely *whenever a hematinic is indicated!*

Each FALVIN Capsule contains:

*Autrinic** Intrinsic Factor Concentrate with Vitamin B_{12}	1 U.S.P. Oral Unit
Ferrous Sulfate Exsiccated	300 mg.
Ascorbic Acid (C)	75 mg.
Folic Acid	1 mg.

Dosage: One capsule twice daily

FALVIN*

HEMATINIC LEDERLE

WITH AUTRINIC*

INTRINSIC FACTOR CONCENTRATE WITH B_{12}

Lederle **LEDERLE LABORATORIES,** A Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

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Allercreme
FACE POWDER
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SKIN LOTION
EIGHT FLUID OUNCES
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Hypo-allergenic Cosmetics
Specifically formulated to meet the rigid requirements of physicians . . . and nationally advertised only in medical journals.
For sample, literature and sources of supply write to:
TEXAS PHARMACAL COMPANY
San Antonio, Texas

NECROSIS and SECONDARY INFECTION of decubitus ulcers ARE CONSTANT THREATS[1-6]

The Alternating Pressure Pad

"...a very effective measure"[4]

Eliminates decubitus dangers and discomfort

When debilitated bed- and chair-ridden patients cannot easily shift their weight, the resultant ischemia frequently produces decubitus ulcers.[1,3,5] These gangrenous lesions are painful, persistent, and prone to secondary infection.[2]

A simple, effective, and time-saving way of promoting local circulation in such patients is the use of the Alternating Pressure Pad. The APP unit is a special air mattress

with two series of air cells, alternately inflated and deflated every three minutes by automatic mechanical means, thereby constantly shifting the pressure points against the patient's skin. Local circulation is encouraged without the trouble and discomfort of turning the patient frequently.[1,4,6] The APP unit is guaranteed to be safe, simple, foolproof.

References cited: (1) Gardner, W. J.: J.A.M.A. 154:534, 1954. (2) Anderson, W. A. D.: Pathology, p. 89, St. Louis, C. V. Mosby Co., 1953. (3) Sutton, R. L.: Diseases of the skin, p. 764, St. Louis, C. V. Mosby Co., 1956. (4) Didcoct, J. W.: 386, *in* Conn, H. F., (ed.): Current Therapy, W. B. Saunders Co., Phila., 1957. (5) Davidoff, L. M.: 497, *ibid.* (6) Gardner, W. J. et al.: Arch. Phys. Med. Rehab. 578:580, Sept., 1954.

in

CHRONIC ARTHROPATHIES
COMA
CONGESTIVE HEART FAILURE
HEMIPLEGIA
HYPOPROTEINEMIA
MUSCULAR DYSTROPHY
NEPHROSIS
PARAPLEGIA
POLIOMYELITIC PARALYSIS
TUBERCULOSIS
TRACTION
WASTING DISORDERS

"The alternating pressure pad is useful... in the prevention as well as the treatment of decubitus ulcers."[6]

Thousands of APP units now in private and government hospitals

Units available for standard beds, respirators, wheel chairs. We will be pleased to demonstrate the APP unit in your office or hospital. No obligation, of course. The APP unit is available for use in hospitals and private homes on a rental basis.

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Manufactured solely by

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_____ M.D.
(name — please print)

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(street)

I would like further information on the Alternating Pressure Pad unit.

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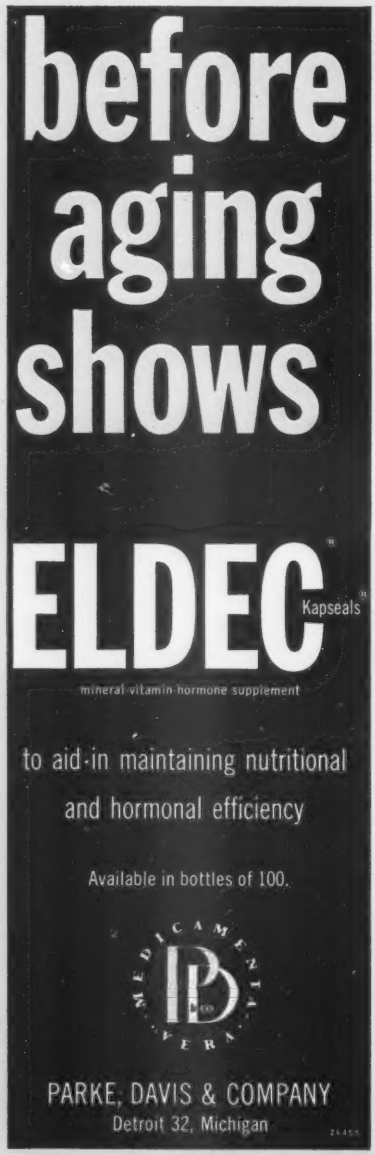
(city, zone) (state)



Activities and Announcements

(Continued from page 98A)

February 21. It was largely through Dr. Kountz' efforts that a research unit in geriatrics was established in 1938 at the St. Louis City Infirmary, now the Chronic Hospital. A former president of the Gerontological Society of America, Dr. Kountz is now vice president of the International Association of Gerontology. Since 1954 he has been scientific director of the Gerontological Research Foundation.

•

Chairman Appointed for Kentucky Commission

Dr. Howard Beers, chairman of the Department of Rural Sociology, University of Kentucky, has been appointed chairman of the newly established Kentucky Governor's Commission on Aging. The first meeting of the Commission in September was devoted to the study of the activities of the state agencies in relation to older people.

•

Bibliography To Be Published

The Pennsylvania State Medical Society is preparing a bibliography on aging for the use of physicians, which will be published in the Pennsylvania State Medical Journal.

•

Revised Film Catalogue

Because of the large amount of material, a revised edition of the catalogue, Motion Pictures-Recordings on Aging, has been published rather than the supplement as originally intended. Requests for single copies and quantities should be directed to the Special Staff on Aging, Department of Health, Education, and Welfare, Washington 25, D.C.

•

New Film

As a part of a four-month public service feature on aging recently completed at Station WCIA-TV in Champaign, Illinois, sequences on nursing homes and homes for the aged were filmed and assembled into a kinescope entitled, *The Good News of Our Little World*. For information regarding loan of the film, write to Mrs. Elizabeth Breckinridge, Illinois Public Aid Commission, 160 North La Salle Street, Chicago, Illinois.

To prevent emotional upsets in cardiovascular conditions

'Compazine', by controlling anxiety and tension, can prevent the emotional upsets that so often play an exacerbating role in cardiovascular conditions.

And, 'Compazine' can be depended upon to have little, if any, hypotensive effect.

*Compazine**

the tranquilizing agent remarkable for its freedom from drowsiness and depressing effect

Available: Tablets, Ampuls, Multiple dose vials, Spansule® sustained release capsules, Syrup and Suppositories.

Smith Kline & French Laboratories, Philadelphia

*T.M. Reg. U.S. Pat. Off. for prochlorperazine, S.K.F.

LETTERS

to the Editors

DEAR SIR: I have just read Dr. Meyer Golob's article, "Nontraumatic Cervical Osteoarthritis in an Aged Patient" in the January 1958 *Geriatrics,* and should like to comment upon it. I found no mention of neck traction until near the end of the article and then no mention of when this was used in his case. Furthermore, I found no reference to neck traction as a diagnostic tool in the reports of any of the consultants. It may be that this therapy was tried early and not mentioned, but I should like to comment upon this, at any rate.

I am a general practitioner in a relatively small town with a small hospital at my disposal. I see a large number of people in the geriatric category, including many patients with shoulder-hand syndrome. Many of these patients have been suffering from this pain for several years and many have consulted other physicians before I see them. Most of these people have had numerous x-ray studies, electrocardiograms, blood studies, injections, and boxes of pills of one sort or another.

If the patient has a normal electrocardiogram and chest x-ray and shows nothing otherwise pertinent on physical examination, but has x-ray evidence of osteoarthritis of the cervical spine, I place him on mild sedation and neck traction (using 5 to 8 pounds with the patient in bed in a low Fowler's position) for up to forty-eight hours.

Traction is applied by means of a head halter and in a straight line with the neck in a normal erect position. This is far superior, I feel, to simply trying to increase the pain by manipulation of the neck or putting pressure on the patient's head as a diagnostic test, for it frequently gives the answer where other methods fail. I have not yet seen this fail to relieve the shoulder-hand pain that is due to osteoarthritis. When the pain is gone, I send the patient home with a halter and instructions for intermittent traction as needed.

My point is that neck traction is a simple, uncomplicated, and relatively inexpensive form of treatment that is quite effective and, I am sorry to say, apparently not well known

(Continued on page 107A)

in geriatric skin care

White's Vitamin A&D Ointment

HASTENS CLOSURE OF SLOW HEALING WOUNDS, bedsores, diabetic and varicose ulcers, burns, abrasions and fissures.

SOOTHES AND PROTECTS DRY SKIN

1½ oz. and 4 oz. tubes; 1 lb. jars and 5 lb. containers.

WHITE Laboratories, Inc.
Kenilworth, N. J.

A NEW, CORTICOSTEROID MOLECULE WITH GREATER ANTIALLERGIC, ANTIRHEUMATIC AND ANTI-INFLAMMATORY ACTIVITY

for your patients with

- BRONCHIAL ASTHMA, ALLERGIC DISORDERS
- ARTHRITIC DISORDERS
- DERMATOSES

Squibb Triamcinolone

KENACORT

- far less gastrointestinal distress
- safe to use in asthma with associated cardiac disease; no sodium and water retention
- does not produce secondary hypertension—low salt diet not necessary
- no unnatural psychic stimulation
- often works when other glucocorticoids have failed
- and on a lower daily dosage range

SQUIBB

Initial dosage: 8 to 20 mg. daily. After 2 to 7 days gradually reduce to maintenance levels.
See package insert for specific dosages and precautions.
1 mg. tablets, bottles of 50 and 500.
4 mg. tablets, bottles of 30 and 100.

CENTENNIAL 1858 1958 SQUIBB

Squibb Quality—the Priceless Ingredient

"KENACORT" IS A SQUIBB TRADEMARK

Documentary Case History . . .

Hypertension controlled for four years with **Serpasil**®

(reserpine CIBA)

K. C., a 67-year-old retired shirt manufacturer, had a 16-year history of hypertension, was troubled by recurrent dizzy spells and headaches. "I'd get several attacks a day. . . . Usually I'd go into the bedroom and lie down." Serpasil therapy was started four years ago, effecting a gradual reduction of the patient's initial blood pressure of 220/120 mm. to the present 140/80. Now well and asymptomatic, ". . . I'm able to go to matinees and see some of the TV shows."

SUPPLIED: TABLETS, 4 mg. (scored), 2 mg. (scored), 1 mg. (scored), 0.25 mg. (scored) and 0.1 mg.

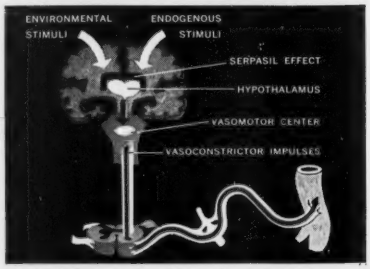
ELIXIRS, 1 mg. and 0.2 mg. Serpasil per 4-ml. teaspoon.

PARENTERAL SOLUTION: *Ampuls*, 2 ml., 2.5 mg. Serpasil per ml. *Multiple-dose Vials*, 10 ml., 2.5 mg. Serpasil per ml.

Hypertension controlled through

SYMPATHETIC REGULATION

Serpasil shields the psychic and somatic reaction centers from emotional and environmental stress stimuli, thereby inhibiting the discharge of vasoconstrictive impulses through the sympathetic nerves.



Adapted from Moyer, J. H., Dennis, E., and Ford, R.: Arch. Int. Med. 96:530 (Oct.) 1955.

C I B A SUMMIT, N. J. 2/2558HK

Letters to the Editors

(Continued from page 104A)

among physicians. I feel that much shoulder-hand pain could be relieved earlier if more practitioners would familiarize themselves with neck traction.

JAMES C. HAWKINS, M.D.
Staunton, Illinois

AUTHOR'S COMMENTS:

None of the consultants suggested neck traction. Dr. Francis W. Glenn, Miami orthopedist, was the penultimate consultant who instituted the treatment of neck traction with over-door apparatus. Had this measure of therapy been resorted to *early*, I believe that alleviation would have set in shortly after onset of the shoulder-hand syndrome. Neck-traction therapy, as I see it, was based on diagnosis and not empiricism.

I still resort to intermittent traction when sensing recurrence of paresthesia in the very tips of the fingers involved. When typing, finger tips must still be protracted with rubber glove tips.

Dr. Hawkins rightly opines that "neck traction is simple, uncomplicated, and relatively inexpensive form of treatment that is quite effective . . . apparently not well known among physicians."

MEYER GOLOB, M.D.
Miami

have you made your contribution to medical education?

Whether you contribute direct to your Alma Mater or your State or County Medical Society or, through the American Medical Education Foundation — Why not DO IT TODAY?

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535 N. Dearborn Street Chicago 10, Ill.

gentle motivation to encourage normal elimination

Sal Hepatica®

LAXATIVE WITH ANTACID

speedy, gentle relief for constipation and excess acidity

Dependable—Draws water into intestines by osmosis, creating moist bulk and gentle pressure to initiate proper intestinal response.

ANOTHER FINE PRODUCT OF BRISTOL-MYERS

Manufacturers' Activities

New Film on Peripheral Vascular Disease

Arlington-Funk Laboratories, a division of U.S. Vitamin Corporation, New York City, recently released "Peripheral Vascular Disease—Physiology and Efficacy of a New Therapeutic Agent," a thirty-two minute motion picture in full color and with sound. The film describes functional and organic occlusive vascular diseases, new methods of evaluating muscle blood flow, and how circulation is increased by Arlidin, a new, synthetic adrenalin-like drug which is a product of Arlington-Funk Laboratories. By increasing total circulating blood volume, cardiac output, and vasodilation, the drug enhances blood flow predominantly in the vessels of skeletal muscle. The film is available for showing to medical organizations and may be obtained by writing to the local distributor for the U.S. Vitamin Corporation.

Packaged Catheters

Prepackaged and presterilized Bardex Foley catheters, which are ready for instant use without processing or autoclaving, are now being distributed by C. R. Bard, Inc., Summit, New Jersey. Hermetically sealed in a transparent plastic enclosure, the package has been tested and approved by 31 hospitals.

•

New Oral Diuretic

Recently released by Merck Sharp & Dohme, Division of Merck & Co., Inc., Philadelphia, Diuril (chlorothiazide) has been shown to be effective in treating hypertension, congestive failure, edema associated with kidney diseases, liver diseases, toxemia of pregnancy, and premenstrual tension. Clinical tests also suggest that Diuril might be of value in bringing about an initial loss of fluid and weight for obese patients. Metabolic acidosis is unlikely as there is relatively little excretion of bicarbonate. The drug is well tolerated, effective both in initiating diuresis and in maintaining an edema-free condition, and can be administered even in the presence of severe cardiac, renal, or hepatic disease.

cerebral arteriosclerosis, mental confusion, forgetfulness and associated symptoms

alleviated with

MENIC™

MENIC combining the analeptic, pentylenetetrazole, with the cerebral vasodilator, nicotinic acid, is *"... safe and simple ... practical and inexpensive ... can be used without hesitation on an ambulatory basis ... especially useful in combating symptoms of abnormal behavior ..."*[1] [1]Levy, S.: J.A.M.A., 153:1260-1265, 1953.

Each scored tablet contains pentylenetetrazole 100 mg. (1½ gr.), nicotinic acid 50 mg. (¾ gr.). In bottles of 100 and 500 tablets. Literature and samples available upon request. Usual dose: 2 MENIC tablets t.i.d., p.c.

GERIATRIC PHARMACEUTICAL CORP. / BELLEROSE, L. I., N. Y.

Pioneers in Geriatric Research

Their physicians used 4 different criteria for selecting a tranquilizer...but ATARAX® is giving all of them relief from anxiety and tension.

AG was restless and irritable. His doctor put him on ATARAX because of its effectiveness and unbroken record of safety, even in patients in their nineties. (No parkinsonian effect or blood dyscrasias ever reported.)

In senile anxiety, TF's physician uses ATARAX as his tranquilizer of choice. He likes the flexibility he gets from its 5 dosage forms (and finicky Mrs. F. loves the tasty Syrup).

MR has had two coronary occlusions. His doctor prescribed ATARAX because it is anti-arrhythmic and safe.

NL was tense and debilitated. She now mixes ATARAX Syrup with her geriatric tonic. Her doctor approves because ATARAX is compatible with other common geriatric medications.

Won't you consider these facts when you see your next geriatric patient?

Supplied: **10, 25 and 100 mg. tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.**

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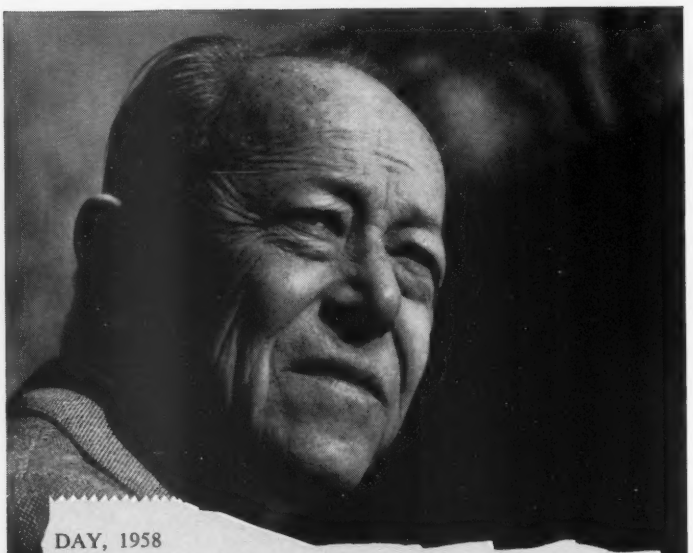
ATARAX® IN GERIATRICS
(BRAND OF HYDROXYZINE)



DAY, 1958

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Easy way to keep your Special Diet patients on the diets you prescribe. Gerber Strained or Junior (minced) Foods require little or no preparation. Both types are economical and easy to obtain at grocery stores. Excellent variety makes it possible to stimulate appetite interest and provide a wide assortment of essential nutrients.

For patients requiring mechanically non-irritating foods, Gerber Strained Foods are ideal. Fruits and vegetables have a low crude-fiber content. Meats have a low fat content. All Gerber Strained Foods have a minimum of seasoning and a smooth, pureed consistency suitable for delicate digestive tracts.

For patients with dental or chewing difficulties, Gerber Junior Foods have a tender, evenly minced texture that reduces chewing effort, yet provides some natural fiber.

Plentiful variety. Gerber offers 5 cereals, over 80 fruits, vegetables, meats and desserts...for menu variation and a "broad spectrum" of nutritive values.

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PRODUCTS

MANDELAMINE... HIGHLY ANTIBACTERIAL YET NOT AN ANTIBIOTIC!

Mandelamine is effective against almost all strains of bacteria found in urinary tract infections—even those resistant to antibiotics and sulfonamides. Mandelamine won't sensitize patients...no resistant strains develop...side effects are minimal. And Mandelamine is priced at just a fraction of the cost of other antibacterial agents!

Available: In 0.25 Gm. tablets, 0.5 Hafgrams® and pleasantly flavored Mandelamine Suspension for children.
Dosage: Adults—initial daily dose of 4 to 6 Gm. Children need as little as 1 Gm. daily. (Mandelamine Discs, for quick identification of Mandelamine-sensitive bacteria, available from your laboratory supply house.)

safe and effective for chronic urinary tract infections

MANDELAMINE®

Brand of methenamine mandelate formerly a product of Nepera Laboratories

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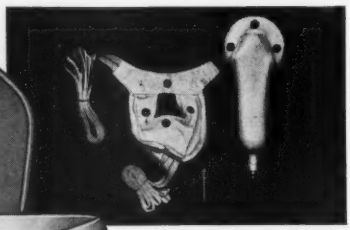
maximum comfort!

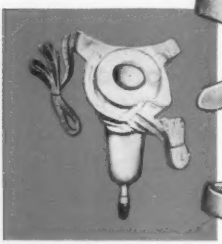
positive protection!

Hanna "Featherweight" Suspensory Urinal
No. 7—Male adult 20 oz. capacity.

Soft cotton-cloth suspensory and light latex top snap together easily. Smooth latex penile sheath cuts to individual fitting.

No. 9, same as **No. 7,** but with large-size suspensory top and closure cap.





Hanna "Featherweight" Drip Urinal
No. 8—Male adult

Ideal for slight incontinence. Removable closure cap, adjustable waistbelt. Soft cotton-cloth suspensory, light latex top. Easy to adjust. Latex penile sheath.

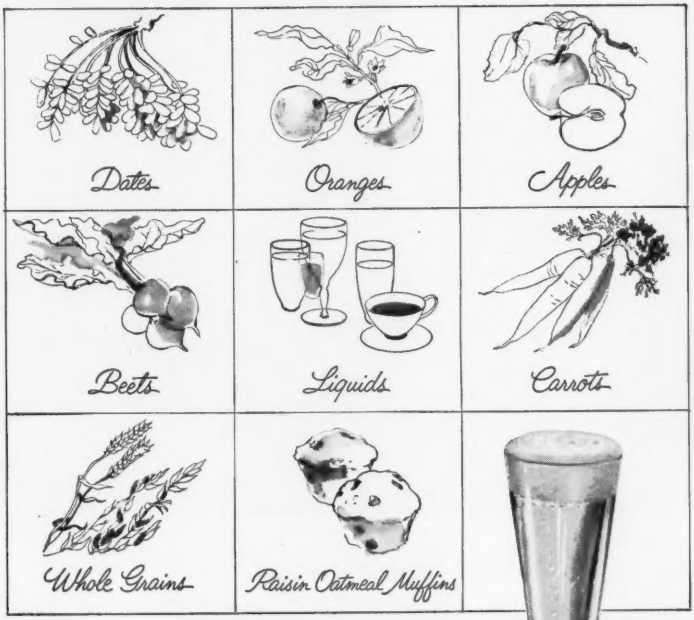
Suspensory urinal **No. 16** for male child also available. Can be cut to individual fitting.

The Hanna Urinal by DAVOL

Most comfortable urinal ever designed. Special Davol construction assures maximum patient comfort and security — sitting, standing or lying down — during day or night use. Incontinent patients will welcome these features: the Hanna Urinal is lightweight; cotton-cloth waistbelt suspensory and support make it cool, easy to wear, to wash, to adjust.

DAVOL RUBBER COMPANY
Providence 2, R. I.

Available through your surgical supply dealer.



Bulk—rough or gentle—
makes the "Regularity" diet work!

And may we suggest a glass of beer to increase the fluid intake?

The "Regularity" Diet

Fruits and vegetables, raw or cooked, are high in cellulose. Oranges, apples, beets and carrots also provide pectin which absorbs more fluid to form especially smooth bulk.

Whole grains contain cellulose and Vitamin B Complex as well. Lots of liquid is important to make the cellulose bulky—about 8 to 10 glasses a day. And some of it might be beer.*

For appetite appeal your patient can team apples with dates. Currants, raisins or fresh cranberries make a tasty surprise in oatmeal muffins.

When your patient makes these bulk-producing foods appetizing, he's likely to include them in his regular diet.

*8-oz. glass supplies about 1/6 the minimum requirement of Niacin and smaller amounts of other B Complex vitamins. (Average of American beers)

United States Brewers Foundation
Beer—America's Beverage of Moderation

If you'd like reprints of this and 11 other dietary suggestions, please write United States Brewers Foundation, 535 Fifth Ave., New York 17, N. Y.

At any age

they welcome Ovaltine for extra nourishment

From pediatrics to geriatrics Ovaltine provides a rich source of the vitamins, minerals and other essential food elements required for the maintenance of a good nutritional state.

Ovaltine is a nourishing, well-tolerated beverage combining natural blandness with good taste. It produces a soothing and relaxing effect for the tense and nervous patient, particularly when taken at bedtime.

It is ideal for use where stimulating beverages should be avoided...ideal as nutritional fortification for patients on bland diets ...or to help maintain a satisfactory nutritional level during physiologic stress.

Three servings of Ovaltine and milk provide:

12 Vitamins	
*Vitamin A	4000 I.U.
*Vitamin D	420 I.U.
*Ascorbic acid	37.0 mg.
*Thiamine	1.2 mg.
*Riboflavin	2.0 mg.
Pyridoxine	0.5 mg.
Vitamin B_{12}	5.0 mcg.
Pantothenic acid	3.0 mg.
*Niacin	10.0 mg.
Folic acid	0.05 mg.
Choline	200 mg.
Biotin	0.03 mg.

13 Minerals	
including Calcium, Phosphorus, Iron and Iodine	
CARBOHYDRATE	65 Gm.
*PROTEIN	32 Gm.
FAT	30 Gm.

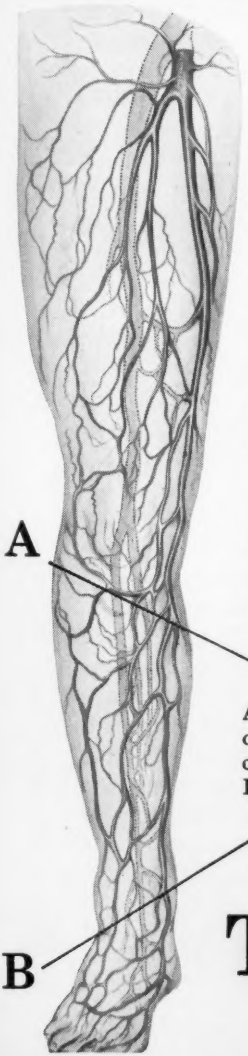
*Nutrients for which daily dietary allowances are recommended by the National Research Council.

A jar of Ovaltine will be sent for your personal use on request.

Ovaltine® *when extra nourishment is desired*

The Wander Company, 105 W. Adams St., Chicago 3, Ill.

Modern way to combat the fourth largest cause of hospital fatalities



A to B indicates common origin sites of Thrombo-Embolic Disease.

The case for T.E.D. elastic stockings as an improved, low-cost method of leg compression

Doctors who recognize compression as a preventive measure for Thrombo-Embolic Disease have usually depended upon elastic bandages.

Now, however, there is an easier, more effective way: T.E.D. Elastic Stockings, developed for routine hospital use by Bauer & Black. The T.E.D. stocking can be applied even by an unskilled nurse's aid with the certainty it will provide positive, even pressure.

Fatalities down, costs down

In tests conducted at Massachusetts Memorial Hospitals, the use of T.E.D. Elastic Stockings as standard procedure reduced the expected incidence of fatal pulmonary embolism by as much as 65%. Yet the cost of the stocking is less than that of two 4-inch elastic bandages. Isn't this safe, simple solution worth investigating further?

MAIL COUPON FOR FULL REPORT

Bauer & Black Research Laboratories
Dept. GE-5, 309 W. Jackson Blvd.
Chicago 6, Ill.

Please send complete literature on the new leg compression prophylaxis using T.E.D. Elastic Stockings.

Name_____

Address_____

City_____ Zone____ State_____

T.E.D.® ELASTIC STOCKINGS

BAUER & BLACK

Division of The Kendall Company

115A

THE ENCOURAGEMENT OF PROGRESS

The American Cancer Society's annual Spring Crusade is the climax of its year-round attack on cancer through research, professional and lay education, and service to the stricken. A study of the cancer scoreboard indicates that steady progress is being made. More and more lives are being saved. Progress encourages more progress.

Earlier diagnosis, new methods of treatment and a greater public awareness have contributed to this progress. It is often said that the life of the cancer patient is in the hands of the first physician he consults. The Society, therefore, conducts a broad professional education program, making available to doctors, through literature, films, exhibits, and other materials, information on the latest advances in detection, diagnosis and treatment.

As the Society aids the doctor, so does its large corps of volunteers aid the cancer patient with dressings, transportation, home care, medication and a host of other vitally needed services.

For the past two years, the theme of the Society's annual Crusade has been "Fight Cancer with a Checkup and a Check." That Americans everywhere are learning the value of the annual health checkup in the fight against cancer, is evidenced by the fact that doctors report they are now seeing more cancer in its earliest stages than ever before.

That American men and women have a personal stake in the program of the American Cancer Society is demonstrated by the public's generous support of the Crusade. This year the goal is $30,000,000 and we are confident that our people will meet the challenge . . . will "fight cancer with a checkup and a check" in the encouragement of further progress.

Lowell T. Coggeshall, M.D., *President*
American Cancer Society

EMDEE* MARGARINE

a delicious table spread

a versatile kitchen shortening

its high corn oil content will not elevate blood cholesterol levels

In Emdee Margarine, 80% of the fat content consists of nonhydrogenated corn oil which has been specially processed to preserve its original content of unsaturated fatty acids. Each 100 Gm. provides 34 Gm. of linoleic acid and 18 Gm. of other unsaturated fatty acids.

Daily use of Emdee Margarine instead of customary table spreads and cooking fats puts a safety factor in the diet... assures patient acceptance... provides a liberal intake of the *unsaturated* fatty acids believed essential in metabolism and important in control of blood cholesterol levels.

Supplied in 1 pound cans, to be kept refrigerated when not in use.

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for your incontinent patients

Chux® DISPOSABLE UNDERPADS

EXTRA LARGE HOSPITAL STYLE 17 1/2" x 24"

For the morale and well-being of the patient and everyone concerned, suggest the home use of CHUX Disposable Underpads Hospital Style. They have the advantage of being:

- **MEDICATED*** to help prevent skin irritations, reduce odors.
- **DISPOSABLE** to make frequent changes much easier, quicker. Saves bed linen.
- **48** underpads conveniently packaged.
- **AVAILABLE** in drug stores.

**quaternary ammonium chloride*

Also, CHUX Disposable Underpads, 13" x 17½", available in **Hamper Pack** 100's. A convenient bedside unit.

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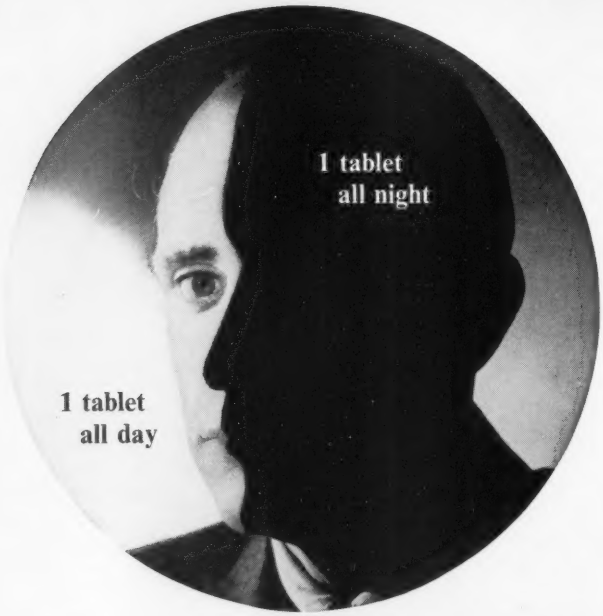
One tablet q. 12 h. to prevent angina pectoris



Provides full 24-hour protection for 8 out of 10 angina patients: In rigorous clinical trials,[1] METAMINE SUSTAINED improved 80 (78%) of 103 patients with angina pectoris, including a group refractory to other medication.

Each METAMINE SUSTAINED tablet slowly releases 10 mg. of METAMINE, the unique, amino nitrate, to provide lasting, 12-hour protection from attacks of angina pectoris.

Simplified dosage—just 1 tablet on arising, and 1 before the evening meal.

Greater economy for your patient with angina pectoris.

Supplied: METAMINE SUSTAINED, 10 mg., bottles of 50 sustained-release tablets. Also available: METAMINE, 2 mg., in bottles of 50 and 500, and METAMINE (2 mg.) with BUTABARBITAL (¼ gr.), bottles of 50 tablets.

[1]Fuller, H. L. and Kassel, L. E.: Antibiotic Medicine and Clinical Therapy, 3:322, October 1956.

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triethanolamine trinitrate biphosphate, LEEMING, 10 mg.

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■ Daily routine use of Isuprel Mistometer* decreases dyspnea, cough and wheezing by improving ventilation and drainage. Constricted bronchi dilate, swollen mucosa shrinks, and expectoration is facilitated with Isuprel nebulization. To increase ease of breathing and exercise tolerance, to improve vital capacity and maximal breathing capacity, include Isuprel Mistometer nebulization *four times daily* with deep breathing exercises** in *every* regimen for chronic bronchitis and emphysema.

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**Patients' instruction sheets available on request

weeks?

months?

years?

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Healing of fractures is often delayed because impairment of osteoblastic activity due to declining sex hormone function causes the bone matrix to atrophy.

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*Reifenstein, E. C., Jr., in Harrison, T. R.: Principles of Internal Medicine, ed. 2, New York, The Blakiston Company, Inc., 1954, chap. 98, pp. 702, 703.

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